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DEPARTMENTAL NOTES AND WORK.

The annual congress of the Agricultural Bureau of South Australia will be held in the Federal Hall, Grote street, Adelaide, during Show week in September. The opening address will be delivered by the Hon. Minister of Agriculture on the evening of Tuesday, September 8, and meetings will be held on Wednesday (morning, afternoon, and evening), Thursday (morning and evening) and Friday morning. Two railway tickets will be available for each branch, and it is specially desired that all members in Adelaide during Show week should make a point of attending at least one meeting. The usual free Parliament will be held on the Friday morning. All papers and subjects for discussion should be submitted before August 12.

The eighth annual Conference of hills branches of the Agricultural Bureau will be held at Cherry Gardens on October 6. The branches within reach of Cherry Gardens should be represented at the Conference. All correspondence concerning the Conference should be addressed to Mr. C. Ricks, Cherry Gardens.

During July Professor Towar delivered addresses before the Public School Teachers' Conference in Adelaide and before the Balaklava Branch Bureau. Mr. H. E. Laffer, Superintendent of Vineyard and Orchard, gave an address on "Treeplanting" at Reeves Plains Bureau meeting.

On July 17, in the presence of a representative gathering, Col. Rowell, C.B., unveiled the tablet erected at Roseworthy College in memory of two former students, Troopers A. W. Nicholas and F. J. Tothill, members of the 4th Imperial Bushmen's Contingent to South Africa, who were killed in the fight at Bethlehem in July, 1900. The tablet was erected by the members of the Roseworthy Old Collegians Association in memory of their comrades.

At the commencement of the second session at Roseworthy College this year there were 51 students in attendance. The annual dance and sports meetings in connection with the College took place on July 17, and was in every way a success.

During the month Mr. Quinn, besides carrying on his usual work at Roseworthy Agricultural College, has visited orchards around Crystal Brook, and along the Beetaloo valley, also at Willunga and Mount Crawford, giving public or private demonstrations of pruning fruit trees in each garden. An

address on "Fruitgrowing" was also given before the Willunga and Mount Compass branches of the Agricultural Bureau at Willunga. Mr. Quinn reports very favourably upon the growth of fruit trees in these districts, and considers that in the ranges below Willunga and around Mount Crawford the possibilities for the production of apples for export to be almost unsurpassed.

During July 4,130 cases of fruits, consisting mainly of bananas, were admitted into South Australia. Within the same period 83 packages of plants were introduced, and 8 parcels were refused admission, through the senders not conforming to the regulations. Among the imported plants were 3,775 fruit trees and 4,000 stocks upon which fruit trees will be worked. The exported fruits inspected prior to leaving the State amounted to 3,094 cases; apples, oranges, and lemons forming the bulk, and ranging in respective order of importance. These figures represent several hundreds of cases of oranges shipped to London, but do not include the exports to Western Australia. Plants to the number of 128 parcels and vegetables totalling 1,719 packages were sent away during July. The supervision of this work has fully occupied the time of Inspectors Brown and Rowell.

During the month Mr. Thomson visited the factories at Mount Barker, Blakiston, Balhannah, and Woodside. At the College he conducted an examination of the second and third year students, and delivered 10 lectures and demonstrations. Eleven samples of milk have been examined for butterfat, and three for water and solids. Four samples of butter were tested bacteriologically to determine the cause of a taint At the School of Mines weekly lectures have been given to a class of students since June 9. A number of the pupils intend to continue their studies at the Agricultural College next year.

DEPARTMENT OF AGRICULTURE.

REMOVAL OF OFFICES.

The Offices of the Department of Agriculture are now situated in the Western Wing of the Jubilee Exhibition Building, North Terrace, Adelaide.

Members of the Agricultural Bureau are invited when in town to call at the Office. The Library of Agricultural Literature possessed by the Department can be consulted by anyone desirous of doing so during ordinary office hours.

LONDON DAIRY SHOW.

In connection with the twenty-eighth annual show of the British Dairy Farmers' Association to be held in October next, the following classes will be provided for colonial butter, open to makers only.

Salt butter, one box, containing not less than 56 lb. First prize, silver medal and £5; second prize, bronze medal and £3; third prize, £2.

Fresh butter, one box, containing not less than 56 lb. First prize, silver medal and £5; second prize, bronze medal and £3, third prize, £2.

Exhibits must be delivered at the hall, from Thursday, October 1 up till 6 p.m. on Monday, October 5. Entries close Monday, September 7; or, with an additional fee of 50 per cent., at noon on Friday, September 11. Remittances to be made payable to William C. Young, 12 Hanover square, London W. Not more than three entries in either class may be made by the same exhibitor.

Entry forms can be secured on application to the Department of Agriculture, Adelaide. It is hoped that South Australia will this year figure in the list of competitors

NOTES FOR DAIRY FARMERS.

By G. S. Thomson, F.R.S.E., Government Dairy Instructor.

GROWING MANGELS.

The mangel crop has many qualities to commend it to every dairy farmer in the State. In the southern parts of Great Britain and in Continental countries the garden and field beet are grown extensively for milking and fattening stock, and also for feeding sheep, pigs, and poultry. During my travels in Europe I had an opportunity of acquiring some information on the advances made in the production of this very valuable food. The mangel is fast taking the place of the yellow and Swedish turnip in suitable dairying districts in England, and, when we consider the many good features of the crop, it is surprising that so little has been done to make it general in this State. The beet family is a lover of a mild and comparatively dry climate; consequently it is not so successfully grown in cold countries, where the short and wet summer season demands the sowing of other roots of greater resistance against the attacks of frost. For this reason dairy farmers in the northern areas of Britain have to give their attention to the cultivation of the turnip for winter and spring feed. In South Australia many dairying centres afford ideal conditions for the successful growing of the mangel, and illustrations are given of the enormous yields per acre taken from land in the State. And so favourable are the conditions here that the crop may be left untouched for over 12 months, and fed to stock without undergoing a period of ripening in pits. As a root food for our cows the mangel is unsurpassed, and the following analytical comparison with the best variety of turnip and green foods will convince readers of its superior qualities:

	H_2O Per cent	Digestible Matter. Albumen	Digestible Matter. Fats	Digestible Matter. Carbo hydrates	Organic Matter.
Swedish Turnip (bulb)	89·4	1·3	0·1	·3	10·0
Mangel (bulb)	88·0	1·1	0·1	9·1	11·2
Pumpkin	89·1	0·4	0·1	5·8	9·9
Cabbage	89·0	1·1	0·2	6·0	9·8

There is a distinct increase of digestible and organic matter in favour of the mangel. Further, the weight of the crop far exceeds the turnip, 60 tons to the acre not being unusual, while its rival rarely reaches half that weight. The leaves of the mangel flourish in this climate, and afford a good meal for cows. If the conditions in our State were favourable to turnip-growing there are many objectionable features to their successful cropping and feeding. The mangel, on the other hand, has a healthy and robust constitution, and its freedom from disease and insect attacks is an important element in its favour; and further, no bad taste is imparted to the milk supply, an objection common to many natural and cultivated fodders.

Unlike some root crops including the turnip, soil sickness following a too close rotation has not been attributed to the mangel. Experiments conducted at Rothamstead have demonstrated that the farm beet can be grown continuously for over half a century on the same land. The test proved that the twenty-fifth crop gave the highest results, and it is believed that many more years will elapse before the soil will suffer injury from the mangel when grown under proper treatment.

Mangels grow well in volcanic, peaty, and clay soils, but depth is necessary for the searching roots. Shallow land, unless heavily dunged, and kept in sufficient moisture, is opposed to successful cropping.

The "seed" of the mangel is of peculiar construction. In each capsule or thick covering there are three or more seeds, two of which should be fertile. This hardened or impervious skin often leads to failure in germination, and to overcome the danger it is recommended to steep the seeds in water for 36 hours, and before sowing dry them in sand, sawdust, or charcoal.

Distributing the seed in a specially prepared plot is generally practised, and when the young plants have grown sufficiently strong they are removed to the land. In sowing care is required not to bury the seeds too deep—a very slight covering is necessary, otherwise germination will be prevented. When large areas are to be cultivated a seed harrow should be used and the mangel drilled in rows from 24 to 26 inches apart. In transplanting the same distances are taken and 10 inches apart is sufficient for the healthy growth of the crop.

In the preparation of the soil care must be taken to have a good seedbed, weeds destroyed and the land thoroughly dunged. To the healthy development of the plant organic matter is essential to a ready supply of nitrogen to meet the heavy demands and to retard the escape of moisture from the soil in dry weather.

The mangel grows in rings like those of a tree, a new ring being added to the outside every two weeks or so, and at the end of growth a good plant should have about [illegible] rings. The outside ring contains more nutriment than the inner one; hence the necessity for leaving the crop longer in the soil to permit of this important function.

In [illegible] the mangel grows rapidly, and instead of a [illegible] [illegible] is less caused by an excess of water and [illegible] substances. This will be better understood by a reproduction of the analyses from McConnell's Agricultural Notebook:

	Organic Matter	Nitrogenous Substances		Soluble Carbohydrates	Fibre
		Albuminoids	Amides, etc.		
Mangels (large)	8 9	1	8	7 4	6
Mangels (small)	10 9	[illegible]	6	9 6	5

The difference in the albuminoid and non-albuminoid digestible constituents of the food is given as follows:

Mangels (large) 1 to 80
Mangels (small) 1 to 29

This table shows that for every part of the valuable flesh-forming food in the large mangel there are 80 parts of sugar compounds, while in the smaller mangel the richness in albumen is much higher. Further, the increase in nutriment in a crop of average weight is illustrated by comparing the manurial value of a ton of large and small mangels consumed in the animal body. For every ton of mangel eaten by stock there is [illegible] worth of nitrogen, phosphoric acid and potash in the manure, a difference of 1 [illegible] per ton against the turnip. These calculations have been arrived at by the famous Rothamstead experimentalists.

Returning to the cultivation, it is recommended to allow the crop to ripen thoroughly before feeding to cattle. Freshly raised mangels are not considered wholesome, as they contain acid substances having purging properties. The bulbs require to undergo ripening after full growth has been attained, when immature substances become changed into sugar and albumen. When storage has been carried out carefully the mangel will keep for seven or eight months. It might be pointed out to farmers when pulling the mangel to avoid breaking the roots or injuring the crown, otherwise bleeding will follow and the bulbs decay.

The mangel is a greedy feeder of manure and responds best to dung. The rapid growth of the plant demands a readily available food and a dressing of nitrate of soda when the crop is a few inches high is beneficial. Potash manuring has been attended with splendid results and this is not surprising when it is considered that over 50 per cent. of that element is contained in the ash of the mangel root. Heavy dressings of common salt have long since been the custom of the farmer, and in inland districts where soil is often deficient in the manure are its good qualities felt. The mangel is a native of the seaside.

MANURING DAIRY LAND.

Manuring land for dairy cows is a subject of importance to the farmer in South Australia. Rotation of crops with manuring to strengthen the soil is practically out of the question on the majority of farms, and the heavy drain occasioned by milking stock must necessarily reduce the fertility of the soil very considerably. Especially will the exhaustion be felt on farms of small acreage with a poor to medium quality of soil heavily stocked, and in a climate favourable to vegetation.

The value of a system of fertilising will appeal more forcibly to the practical mind when it is considered that the cow in maintaining her bodily health and vigour and supply of rich milk derives the nutritive elements from the food eaten on the land. The annual removal of immense quantities of manurial constituents is borne out by the fact that a cow yielding 600 gallons of milk in the year takes off the farm when the milk is sold approximately 36 lb. of nitrogen, 12 lb. of phosphates, and 10 lb. of potash. Together with an incessant demand for support of the animal's body and the nourishment of the unborn calf, paddocks will be robbed of much of their natural fertility.

To grow a crop of wheat on farms of long cultivation, manures are an essential feature to success, similarly with other cereals and roots. Why, then, should we not give some return to the soil for what the herd of milk cows utilizes in the pastures consumed? The great benefits obtained are not alone confined to the increased value of the milk yield, and the improvement of the land in manurial wealth and texture, but manures reduce the severity of drought on plant life and especially is this apparent when decayed vegetable matter and dung form the basis of the nutriment added.

Further and vitally important to the dairy farmer is the provision made against the attacks of disease which manifest themselves when cows are grazed on land of poor heart and texture. Authentic cases of bodily ailments have been severely illustrated in many of our dairying districts, and in the experience of farmers rapid improvement in health of cows has resulted from a change to better pasture. We have been educated to provide our milk cows with small quantities of ground bone and superphosphate to supply the phosphatic constituents awanting in the soil and pasture and to amend the physical weakness in the animals wrought by the impoverished land. The gain in the quality of herbage by the practical application of manures is still further exemplified by the more rapid development of stock and quicker fattening propensities.

Let the dairy farmer study the question more closely, and may his endeavour be to make the best uses of the manure of the farm, to increase the organic matter in the soil, and to sow fertilisers where their value will be most beneficially felt.

TWELVE RULES FOR THE MILKYARD.

One of our large suppliers has determined to put into practice a sound system of treatment and milking of cows. With this laudable object in view he has written for a list of rules to be hung up in the milkshed for observance by his milkers. Where wilful neglect is shown of any of the restrictions he has decided to punish the offenders by the infliction of a fine, the severity to be in accordance with the seriousness of the offence.

The table of rules forwarded are as follows:

1. Cows must not be hunted to or from the milkyard.
2. A dog must not be employed to round cows kept for milking purposes.
3. The use of the whip shall be regarded a very serious offence.
4. Boisterous language in the milkshed and striking cows with legropes and other articles will meet with punishment to the offenders.
5. Nervous cows claim special consideration and treatment.
6. Animals suffering from injured teats must be milked last, and the injuries attended to.
7. Cows must be thoroughly stripped (the cream is in the strippings).
8. Cleanliness of the cowshed and yard are features of great importance to the farmer.

9. Cleanliness of milkers' clothes, utensils, teats and udder of the cow, are essential elements to the keeping properties of milk.
10. Milk from freshly calved cows is injurious for butter and cheese making until five days have passed.
11. When cows are drying off, and the milk badly flavoured, it is hurtful for butter and cheese making.
12. Don't send the milk from cows suffering from disease of the udder to the factory.

COLOSTRUM AND WEEDY FLAVOR.

In the list of rules I have stated not to use the milk from freshly calved cows until the lapse of five days from the birth of the calf. It must be remembered that the above time is taken as a safe average, but we have had many instances of the milk from cows being unfit for factory use 10 days after calving.

I make a special appeal to farmers at this time of the year, when there is a possibility of colostrum finding its way into the milk supply and doing injury to the export and local supplies of butter. The constituents of "new" milk are also hurtful to the quality of cheese, causing rapid decomposition in the product. Weedy flavours are becoming troublesome in some districts, and to reduce the taint in milk I would recommend the use of a small quantity of warm water and a pinch of saltpetre in the milk pail before milking each cow.

VALUE OF STRIPPING COWS.

The gain in stripping after milking has been demonstrated to the students very clearly during the past month, in a series of butter-fat tests of the first and last milk from a number of College cows. Outside of the students' education, the results should be of sufficient value to further impress upon all owners of cows the necessity for thoroughness in milking.

The following are the percentages of fat found in large samples of the first milk and strippings of the morning yield:

	First Milk. Percentage of fat.	Strippings. Percentage of fat.
No. 1.	2.4	17.0
No. 2.	2.1	15.0
No. 3.	2.2	9.6
No. 4.	1.8	7.4
No. 5.	1.8	7.4
No. 6.	2.0	6.0

Had smaller quantities of milk been taken, the differences would have been greater, the first milk lower, and the last higher, in the fat reading.

In the afternoon supply at one of our farms, four cows gave as follows:—

First Milk. Percentage of fat.	Strippings. Percentage of fat.
2.1	9.7
2.4	8.3
2.0	7.5
1.8	8.5

Believing that the first of the morning milk was lower in butter-fat than the evening and the strippings higher, experiments conducted by me over two years ago resulted as under.

	First Milk. Percentage of fat.	Middle Milk. Percentage of fat.	Strippings Percentage of fat.
Morning	1.2	3.9	7.8
Evening	2.8	5.0	6.3
Morning	1.0	3.4	10.2
Evening	2.6	5.0	8.2
Morning	1.2	4.5	9.2
Evening	2.1	4.8	8.0

By numerous trials I have found that cows giving rich milk yield more fat in the strippings than cows giving a poorer supply; and experience proves that rich milk commonly follows a small yield: for example the Jersey breed. How necessary it is to thoroughly strip the "small milkers" to obtain the cream of the supply, and not to leave it to reduce her yield and injure her milking qualities. Good milking increases the value and profit of a herd.

NOTES FOR FACTORY MANAGERS.

BUTTER MAKING.

By G. S. Thomson, F.R.S.E., Government Dairy Instructor.

(Continued from page 745.)

Churning

When the pleasant acid flavour is tasted in the cream it is ready for churning. In the summer months it is recommended to have the consistency of cream thick for more than one reason: thick cream does not develop acid so readily, it keeps better and it can be churned at a lower temperature than a thin product.

Factories equipped with refrigeration are in a position to grapple successfully with a great factor in butter making, i.e., temperature. In the hot season cream chilled from 46 degrees to 52 degrees F. at the time of churning will give a firm glittering grain, while the heated body will be sticky and oily, making a butter difficult to wash and work. Rapid chilling must not be resorted to, as the fat will not firm into fine grains of butter, though the temperature of the cream is sufficiently low to expect the best results. With a firm grain, buttermilk is easy to run off and immediately this is done apply the hose and carefully pour the chilled water over the grains, until it comes off clear. At intervals keep the churn moving backwards and forwards to circulate the water thoroughly. Have ready a solution of brine, for which chilled water should be used, and pour into the churn, revolve once or twice, and leave for 10 minutes. Run the brine off, and as speedily as possible put the butter on the worker.

Working.

Work for a round or two, but do not go fast, then salt lightly. After brining, little dry salt is required, therefore less working is needful to mix the preservatives thoroughly. Choice export butter for the London market is better to be on the sweet side than too salt. At this stage in butter making much damage is done, and my experience has convinced me that tallowy flavours result from churning at high temperatures, over working at the beginning and especially is the evil increased when the butter is worked too long a second time after it has hardened, and at too great a speed of the rollers. Three or four hours in a cool temperature between the working is sufficient for brined butter.

Packing Boxes

Care must be taken to have the best parchment paper, as a good quality adds to the appearance of butter and protects it against injury from the wood in the box. Double paper is recommended, the advantages being sufficient to warrant the outlay. With the boxes properly lined and everything in readiness, remove the butter from the worker and pack, taking precautions to fill every corner, and have the sides free from defects. Upon no account use boxes having holes, or otherwise damaged.

Preservatives

When adding preservative powders to butter, remember that a standard has been fixed by the home authorities. Excess of 0.5 per cent. of boracic acid, or 35 grains to the pound of butter, is punishable by law.

Experiments conducted by me three years ago proved that 8 oz. of a preservative containing 82 per cent. of boracic acid to 100 lb. of butter gave the best results in a product of good quality. Do not exceed that amount.

FACTORY THERMOMETERS

In conclusion, I wish to draw the attention of managers to the need for using thermometers of a reliable kind. Instances of inaccurate thermometers have come before my notice recently. A degree or two wrong in butter making does not incur much danger, but in cheesemaking the risks are more serious. Managers can have their thermometers tested free of charge by sending them to the Department of Agriculture.

GRADING BUTTER.

Throughout the approaching export butter season, it is my intention to continue the grading on the same lines as conducted during the past five years. Our system has given satisfaction to the manufacturers, and the State depot, instead of being used expressly for the chilling and shipping of dairy produce, has been to the manufacturer an educational institution. Every consignment of butter no matter how small, is examined for flavour, texture, colour, salting, and packing, and reports, with instructions for future treatment where required are forwarded the same day to the factories. The condition of boxes, whether soiled or broken, is carefully noted upon their arrival at the depot, and the consignee apprized of the damage done, to afford him an opportunity of determining the cause and the responsible persons.

It is very surprising that so much opposition is given to the practice of grading when the system has proved instructive and protective to the State generally It has been my opinion from the outset, that grading on proper lines is the best means of safeguarding the good name of the dairying industry in the British markets My enquiries at London elicited strong evidence of the great danger we have incurred in shipping large consignments of butter which have not corresponded in quality to the brands on the boxes.

A visit to the wholesale and local markets throughout the United Knigdom and especially in Copenhagen, would show the butter makers how very desirable it is to grade thoroughly. It has all along been our endeavour to screen our weaknesses in the quality of export butter by alluding to the long distance the produce has to travel from Australia to England, but it has been demonstrated that a choice product will keep its flavour weeks after ts arrival at Tooley street Fishiness in butter has always been an obstacle to grading and which I have shown to develop at very low temperatures, is being yearly overcome hence the more need for closer inspection.

Whatever the weaknesses of the system might be, butter of a third or pastry quality at the port of shipment will not grace the home market improved in flavour and texture to commend its sale as a first and second rate article It has been our endeavour to ship produce in abundance, to show numerically the extent of the trade, but, to a very large extent, regardless of the hurtful influences of the low-grade quality. Among the chief causes attributed to an excess of pastry butter is the home separator, but it has been my contention that with the separator in its right place, and in the hands of a careful and competent manipulator, who understands the dangers common to cream, no damage to the industry need have been caused. Education alone will improve the standard of cream in the farm, and to this attention should be constantly directed Let us hope that every one will endeavour to raise our industry, and this year we shall see an improvement in our output of butter.

INOCULATING THE SOIL WITH THE TUBERCLE GERM OF LUCERNE.

By J D TOWAR, PROFESSOR OF AGRICULTURE.

With any plant of the pea, bean, clover, lucerne, or any of the other clover or leguminous family—that is, those plants which bear their seed in pods—we will find on its roots a wart-like growth or tubercle. There is every reason to believe that it is through these tubercles that the leguminous plants, commonly called legumes, acquire their atmospheric nitrogen. These tubercles become attached to their host through contact in the soil of the roots of the legume with germs of the tubercle. Just how the germ finds its way to new soils is not thoroughly understood, but it is known that a soil which has been artificially infested with the germ or has previously grown the particular legume will grow more tubercles and larger crops than uninfested soils, unless the soil, in each case, be so thoroughly rich in available nitrogen that the plant is not required to draw this element from the atmospheric supply.

Experiments have shown that soils taken from a field which has previously grown lucerne and thoroughly mixed with a virgin soil, or one in which lucerne has never been grown, has resulted in vastly increasing the number of tubercles formed, and so materially improving the growth of the crop as to prove the operation profitable. This seems like an enormous task when one contemplates the sowing of many acres, but as we find it necessary to mix sand or phosphate with the seed in order to sow it through the fertiliser drills we may improve the chances of the lucerne crop by diluting the seed with soil which has previously grown lucerne, and thereby bring the seed in direct contact with its own friendly germ.

If this scheme is to be undertaken it is necessary to observe that the soil should be taken only from land where tubercles appear on the roots of the lucerne; that, if necessary to dry and screen the soil, it should not be exposed to direct rays of the sun; and that, in sowing, the soil should be brought in direct contact with the seed, and be completely covered. One of the reasons why lucerne thrives well in light, dry soils is that it sends its roots deeply into the subsoil, drawing moisture and food from great depths, and the fact that through the tubercles on its roots it secures nitrogen from the air. Where it fails, the experiment suggested alone might be tried with a fair hope of success. The seed can be mixed with germ-infested soil and sown broadcast, but in this case the sowing should be done on a cloudy day, and barrowed in before it is exposed to the direct rays of the sun.

ROSEWORTHY AGRICULTURAL COLLEGE NOTES.

FARM.

By J. D. Towar, Principal Roseworthy College.

The crops are looking generally well. Owing to the cold, cloudy winter growth has been slow but healthy. Forty acres of barley in Dahlitz became so rank and forward that for two weeks the sheep and cattle were turned in to pasture it down. The Island is somewhat uneven, though generally fair. Flett's which is being cropped this season for the first time since its purchase by the College, has a very clear even crop, which promises a good yield. No. 6 is devoted entirely to experiments. It was sown late, and the crops are not forward. In the fertiliser trials it is only recently that any differences have appeared, and they still are very slight. The lucerne, which was sown May 13, has withstood several severe frosts, and is now making a satisfactory healthy growth. Feed in all the pastures is excellent, there being more than we have the stock to consume.

The lambing season has been remarkably successful, the percentage being 90, and the lambs strong and healthy. The College farm is large enough to maintain a larger flock of sheep, and, as soon as fencing can be completed, we should increase the flock to nearly double its present number. There is but one field—the Island—which cannot be readily connected with the Barossa water supply, whenever the dams become exhausted. Mr. Thomson is conducting some experiments in rugging cows. Weekly tests of the milk of all the cows are being conducted.

The horses are in general fair condition. They are now being worked to their limit at fallowing. In fact we need a few more good young horses. The horse clipping experiment is progressing, the only apparent result being that the clipped horses work without sweating, and they do not seem to tire so readily; no bad results have followed the clipping. One horse has gained considerably in flesh, but the other three remain about the same as their mates which were not clipped.

In swine, weaners have been in excellent demand and good; the young breeding sows are all sold out. We have a few good young boars yet for sale, ages from 8 to 12 weeks. We plan to enter the older boar at the Adelaide Show, and offer him for sale afterwards, with the object of securing fresh blood. We may exhibit a couple of brood sows also. We are feeding a little molasses with pollard and grain to some fattening pigs, in comparison to a similar ration without the molasses. The experiment has not progressed far enough yet to give any idea of the final results.

Farm Work.—All the horse labour is busily engaged in fallowing, about 220 acres of which is now completed. A considerable amount of fencing has been done to complete sheepproof enclosures at Ebsary's. A good portion of the team and student labour has been devoted to the gardening and road repairing work about the College buildings.

Experimental Vineyard.

By H. E. Laffer, Superintendent of Vineyard.

The season is advancing, and work is well in hand. First ploughing will shortly be completed, and with it all hoeing of strips and filling up of blanks in rows of vines. Pruning also is fairly well forward, all the older vines being completed. Manures have been applied to the vines where necessary. The manured plots were treated with the same manures as last season One block is devoted to testing the relative value of manure applied up the central furrow of the row and that placed directly around the stems of the vines.

A number of trees of various kinds have been purchased to replant the old orchard which was uprooted Strips of soil about 8 ft. wide were subsoiled to take the rows of trees. Provision is being made for a small nursery where the raising of stocks may be demonstrated.

Mr Quinn has planted numerous belts of pines which, when they grow, should considerably improve the general landscape view.

A vigorous growth of thistles, &c., rendered ploughing very difficult in some parts of the vineyard, but this trouble was overcome by turning the sheep in for a few days

Except for one or two frosts early in the month the weather has been remarkably mild. Close upon an inch of rain has fallen during the month, making the total for the year about 10 in. The vine hoe continues to give general satisfaction, and will be the subject of a special note in a later number of the Journal

VINE AND WINE NOTES.

By Arthur J. Perkins, Secretary for Agriculture

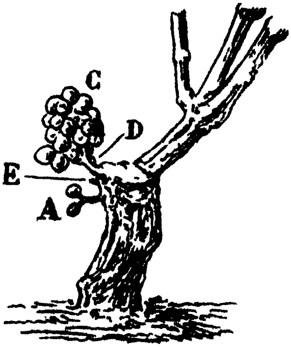
In some of our earlier issues I expressed a certain amount of scepticism in respect to the theory that would attribute the development of seedless fruit, such as currants and sultanas, to parthenogenesis or development without fertilisation. Amongst the higher plants fruit production is so essentially a phenomenon dependent on the stimulus of fertilisation, and as such distinct from mere phenomena of growth, such as leaf and shoot production, that notwithstanding that analogically the various component parts of a flower are merely highly specialised leaves, it is only by a series of the most carefully executed experiments that their subsequent development into the still more highly specialized fruit can be admitted in certain circumstances as a mere result of sap influence independent of fertilisation. Assertions, unsupported by facts that can be controlled or even inferential reasoning from casual observations, cannot be accepted as proofs of what must remain an anomaly in Nature. Latterly, in The Revue de Viticulture, M. Rabati, whilst dealing with the influence of foreign pollen on the structure of fruit, incidentally refers to the development of seedless fruit. I append in free translation what has reference to this question:—

"The direct influence of pollen on crossbred seed receives a natural explanation in the discovery of the existence of double fertilisation by Messrs. Nawaschine and Guignard in 1899. The pollen tube is possessed of two nuclei, one of which fertilises the oosphere, from which results the ovule, and the other joins the central nucleus of the embryo sac, giving rise to the endosperm. Hence, the development of the endosperm is just as much the result of separate fertilisation as that of the embryo itself. The former is, in fact, an accessory plant independent of the mother plant, and associated with the embryo with a view to facilitating its development. According to Vries it may be looked upon as the twin cell of the embryo. . . . The development of seedless berries may be explained by abortion in the fertilisation of the oosphere, and successful fertilisation by one of the pollen nuclei of the reserve material cells."

This view may or may not be correct; it should be noted, however, that on the assumption that partial fertilisation does take place, we must assume not only abortion of the embryo, but also of the endosperm, for in the ripened seedless fruit there is no more trace of endosperm than of embryo. After all the pulp is the developed ovary, and no part of the embryo sac; and on the bare facts I hardly see justification for the assumption of only partial fertilisation.

* * * * *

A curious phenomenon is recorded in The Revue de Viticulture of April 30, an illustration of which accompanies these notes. An eleven-year-old Pinot vine was cut back in winter with a view to the removal of superfluous old wood; towards the middle of June (corresponding to November on this side of the equator) well-developed flower bunches were noticed growing direct from the stem, as shown in our illustration. At the base of these bunches there was no sign of bud, or scale of any sort to indicate that the bunch had in any way sprung from a neglected bud imperfectly removed at pruning time; in fact, the observer is confident that the bunches in question issued directly from the old wood of the stem, constituting thus a somewhat unusual phenomenon. Two of the bunches, A and C in the illustration, developed into well-ripened fruit differing from other bunches in their rigidity, A growing in a horizontal direction and C upwards and more or less vertically. At the base of the fruit stalk of C in D what was originally a slight scale, developing on ordinary bunches either into a tendril or a minor subdivision of the bunch, towards the end of the season was produced a large and well-developed bud. The question is certainly curious, indicating as it does that fruitful buds may arise occasionally, not only on ordinary water shoots, but may lie embedded in the old wood for a considerable number of years without losing any of their previously acquired characteristics.



Vinegrowers are well acquainted with the difficulties of filling blank spaces in old vineyards; rooted vines have no chance of success, and the shoots of neighbouring vines are generally too short for successful layers. Grafting a shoot on to the layer has frequently been recommended, but until recently I have never had the opportunity of seeing the operation put into practice.

It was, therefore, with pleasure that I accepted an invitation from Mr. H. V. Pridmore to view some successful grafted layers in his Glen Osmond vineyard. Mr. Pridmore has evidently been very successful in this work, and what he has done can safely be recommended to others similarly situated. A suitable shoot is selected in March before the plants have entered the dormant stage, and its extremity cut obliquely for whip and tongue graft; another shoot of sufficient length is secured and grafted on to the layer, and both are firmly bound. A trench is opened out in the ordinary way, and the summit of the scion made to occupy the blank space; the soil is filled in, and the parent vine pruned immediately. Mr. Pridmore considers that this latter operation tends to throw the sap to the point of union; to what extent this view is justified it is difficult to state; at all events the success of his grafts appears to amply justify his practice. I had occasion to examine some of last season's layers, and there is no question that the unions were irreproachable. Mr. Pridmore purposes already severing the young plants from the parent stem. I cannot help thinking that the operation is somewhat premature; personally, I would not sever them before the third or fourth year.

Lactic acid has always been looked upon as undesirable in any wine; it is usually the result of mannitic fermentation of sugar, or of the decomposition of tartrates. It comes, therefore, as a matter of surprise to learn that this development in wines is far more general than has usually been supposed, and that in the circumstances its presence must be looked upon not as a sign of unsoundness, but as a special stage in maturity or development. This, in any case, is the burden of a recent article by Mr. E. Kayser in The Revue de Viticulture. The slow decrease in acidity of sound wines has usually been attributed to the precipitation of cream tartar, oxidation, and etherification. To these factors we learn now there must be added the action of micro-organisms that cannot in any way be looked upon as disease germs. Koch, for instance, has isolated bacteria which in the course of three months reduced the natural acidity of a wine by 50 to 60 per cent. without in any way impairing its soundness, whilst a carefully sterilized wine remained stationary. There is apparently decomposition of malic acid, with residual formation of lactic and carbonic acids, neither citric, tartaric, nor succinic acids are attacked. If these facts are correct—and there appears no reason to doubt them—they form a heavy indictment against the theory that sterilization of the must and fermentation by pure yeast must necessarily tend to the production of a high-class wine. We have, after all, some use for the much-despised bacteria!

PREDICTION OF THE ALCOHOLIC STRENGTH OF WINES BASED ON THE SPECIFIC GRAVITY OF CORRESPONDING MUSTS.

By Arthur J. Perkins and W. R. Jamieson, B.Sc.

(Continued from page 738.)

In Table II. we have inserted various figures having reference, on the one hand, to the quantities of sugar ascertained to be present in six musts by direct chemical estimation, and on the other to the quantities that might have been assumed to be present by calculations based on their respective specific gravities.

TABLE II.

COMPARISON OF OBSERVED AMOUNTS OF SUGAR WITH THOSE CALCULATED FROM SPECIFIC GRAVITIES OF MUSTS

Specific Gravities at 15° C., Water = 1000.	Beaumé's Hydrometer	Sugar Ascertained to be present by Fehling's Solution.	Sugar Calculated by Dubrunfaut's Formula. N = 30.	Actual Value of N derived from Estimations with Fehling's Solution.
		Grammes per litre.	Grammes per litre	
1083	11·0	197	191	24
1094	12·4	225	221	26
1103	13·5	246	245	29
1115	14·8	278	277	29
1124	15·9	299	301	32
1127	16·2	306	309	33
	Mean value of N derived from Estimations with Fehling's Solution .			29

In this table, for the benefit of those who still make use of Beaume's arbitrary hydrometer, we have indicated, in the second column, Beaume degrees corresponding to the respective specific gravities. It will be noted that the calculated results approximate fairly closely those observed in actual analyses, the greatest discrepancy being represented by 6 gr. to the litre in the case of a must of a specific gravity equal to 1083. It is quite evident, therefore, that our results tend to prove that, to a very great extent, as much reliance may be placed on Dubrunfaut's formula in South Australia as in Europe. It is true that the mean value of the non-sugar (N) is represented in our results by 29, and not 30. The figures from which this mean value is derived are represented in the fifth column of Table II.; they are obtained by subtracting from the grammes per litre of sugar determined analytically the corresponding values of Dubrunfaut's formula. We do not, however, look upon our tests as sufficiently numerous to render generalizations in any way safe, and we favour the retention of the usual factor until more numerous experiments can confirm our present results or otherwise invalidate its accuracy. It should be noted, too, that this factor N is by no means constant or independent of the specific gravity of the must. Column 5 shows its steady, though somewhat irregular, rise from 24 to 33, in harmony with a gradually increasing concentration of the sugar. Whether confirming results may be secured in future seasons is a point that is not without its interest.

We have no special wish to see Dubrunfaut's formula superseded, unless it can be shown to be out of harmony with local conditions. It is calculated from data, the accuracy of which may generally be admitted in ordinary practice. It is first assumed that a must is a simple sugar solution, on which there is no appreciable contraction, and that in consequence the strength of the latter is a direct function of its density; then, as has already been explained, a fixed quantity represented by 30 is subtracted from the theoretically calculated sugar, to make allowance for the non-sugar in solution. An empirical formula agreeing more exactly with our analytical results would be represented as follows:—

$$\text{Sugar in grammes per litre} = \left\{1{\cdot}96 + 0{\cdot}198\,(d - 1000)\right\}\frac{d}{100}$$

in which—

$$d = \text{Specific gravity of the must, water} = 1000.$$

In Table III. are given the results calculated by this formula compared with those actually observed in analyses and those calculated by Dubrunfaut's formula.

TABLE III.

COMPARISON OF RESULTS FROM NEW FORMULA WITH THOSE OF ANALYSIS AND THOSE CALCULATED FROM DUBRUNFAUT'S FORMULA.

Specific Gravities at 15° C.	Sugar estimated with Fehling's Solutions.	Sugar calculated by Dubrunfaut's Formula.	Sugar calculated by New Formula.
1083	197	191	199
1094	225	221	225
1103	246	245	247
1115	278	277	276
1124	299	301	298
1127	306	309	306
Mean .	258 5	257 3	258·5

IV.

In Table IV., column 5, are given calculated figures of the "non-sugar" corresponding to the different musts. They are derived from the observed amount of sugar on the one hand and Dubrunfaut's formula on the other. With a view to checking these figures we endeavoured to obtain the proportion of total extractive matters from a given volume of must. We anticipated that the proportion of sugar having already been ascertained, the non-sugar would be given with sufficient accuracy by difference. Unfortunately the complete drying of a liquid rich in sugar is by no means a simple matter. Without previous experience in the matter we adopted desiccation over a steam bath for six consecutive hours. Our comparative results are inscribed in Table IV. Whether the divergence between the figures in columns A and B is due partly or entirely to defective desiccation, we are not in a position at present to decide.

TABLE IV.

COMPARISON OF OBSERVED "NON-SUGAR" WITH CALCULATED "NON-SUGAR."

Specific Gravities at 15 C.	Sugar by Fehling's Solution.	Total Extractive Matters by drying over steam for 6 hours	A Non Sugar from Dubrunfaut's Formula and observed amount of Sugar.	B Non-Sugar by difference of Sugar from Extractive Matters	Comparison of A with B.
	Grammes per litre.	Grammes per litre	Grammes per litre.	Grammes per litre	
1083	197	242	24	45	+ 21
1094	225	260	26	35	+ 9
1103	246	279	29	33	+ 4
1113	—	313	—	—	—
1116	—	326	—	—	—
1124	299	331	32	32	0
1127	306	348	33	42	+ 9

V.

Finally, on the assumption that a given amount of sugar will, on the average, yield the same amount of alcohol here as in Europe (we have already pointed out why we are inclined to question the strict accuracy of such a position), on this assumption, however, we have indicated in Table V. the probable alcoholic strengths of the musts calculated (a) from the observed amount of sugar; (b) from sugar indicated by Dubrunfaut's formula; and (c) from sugar indicated by our tentative formula.

TABLE V.

Comparison of Predicted Alcoholic Strengths of Wines as derived (A) from Observed Percentage of Sugar; (B) Percentage of Sugar calculated from Dubrunfaut's Formula; (C) Percentage of Sugar calculated from Tentative Formula.

Specific Gravities of Musts at 15° C.	Calculated Alcoholic Strengths. Absolute Alcohol in Volume from observed amount of Sugar.	The Same in Terms of Proof Spirit.	Absolute Alcohol in Volume from Sugar by Dubrunfaut's Formula.	The Same in Terms of Proof Spirit.	Absolute Alcohol in Volume from Sugar by Tentative Formula.	The Same in Terms of Proof Spirit.
	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent
1083	11·6	20·3	11·3	19·8	11·7	20·5
1094	13·3	23·3	13·0	22·8	13·3	23·3
1103	14·5	25·4	14·4	25·2	14·6	25·6
1115	16·4	28·7	16·3	28·6	16·3	28·6
1124	17·6	30·8	17·7	31·0	17·6	30·8
1127	18·0	31·5	18·2	31·9	18·0	31·5

NOTES ON FOREST TREE PLANTING.

By Walter Gill, F.L.S., F.R.H.S., Conservator of Forests.

The question of temperature is one which is often treated with scant consideration, if, indeed, it be not entirely ignored by many tree planters. No factor, however, has so much influence for or against success with some trees, and to neglect it at the critical time is to court certain failure. Deciduous trees and pines may be somewhat checked if hard frosts should be unusually prolonged, but, generally speaking, no further injury would be sustained, though in exceptional cases where frosts strike with special severity in low-lying sites even pines may be frostbitten beyond recovery, but this is a rare occurrence.

With tender, young gums of all kinds, however, which have not been hardened off, and with sugar gums particularly, frost is a very serious danger, which must be reckoned with if satisfactory results are to be gained; and there is no doubt that many thousands of trees annually perish through neglect of this danger. In many districts in this State it can usually be safely calculated that by the end of August the frosts have practically ceased. In some localities farther north they may cease earlier, in others farther south they may last rather longer. Of these conditions the residents of any given locality are generally in a better position than any one else to record careful observations regarding frost intensity and duration, and there is no justification for neglect in so vital a matter where simple records may prove a safe guide.

It may not, however, have been noticed by many persons that the position of any special place or "site" which it is intended to plant may have a very important bearing on the question of temperature. If, for example, the planting "site" is situated on a hillside the probability in most cases is that frost will not strike hard on such a position. If, on the other hand, it is right down in a valley adjacent to either running or stagnant water frost is usually certain to strike with damaging intensity. In judging as to the risk of planting

Plot treated with Bordeaux mixture—32 per cent. diseased.

Untreated plot—37 per cent. diseased.

About the same time the owner of the land (Mr. M. Clements) sent 200 plants from his own sowing on new land, and of these only one was found to be diseased. Of the diseased plants not more than 20 per cent. could be detected with the naked eye; about the same proportion with a good lens after the roots were washed, and the balance was only detected on close examination under the microscope. This explains why a grower, after carefully rejecting all the diseased seedlings he can detect, finds the disease rampant in his fields.

Writing on June 29, Mr McAlpine says that there is only one certain means of checkmating the disease, and that is to sow seed in absolutely new ground, where no cauliflowers cabbages, or turnips have previously been grown. Failing this three or four years should be allowed to elapse before seed is again sown on any land previously occupied by these plants. There is little danger of the plants being attacked after they have been transplanted, but badly infested paddocks should be given a two years' spell to some other crop.

Amongst other preventive treatment recommended are:—

1. Apply bluestone solution (1 oz. to 2 gallons of water) with a watering can at the rate of 2 gallons per square yard a couple of days before sowing the seed. On no account should a heavier dressing than this be given. It will probably be best to apply half the quantity first, then turn the soil over lightly, and apply the balance.

2. Use only selected seed of the best varieties. It is probable that some varieties will resist attack better than others, and this matter should have attention.

3. When planting out exclude all seedlings which have not perfectly clean healthy stems and roots.

4. Destroy all refuse of previous crops, as the fungus will continue to propagate on the decaying remains.

This last point is very important. The usual practice is to put the diseased plants on to the manure heap, or to plough them under, thus making certain the reinfection of the land.

Experience has shown that, like most other fungi, the attacks of this disease are most severe when wet weather is followed by warm days. This would account for the severity of the attack in South Australia during the past autumn, which has been exceptionally moist.

LARGE, HEAVY SEED *versus* SMALL, LIGHT SEED.

By Arthur J. Perkins, Secretary for Agriculture.

In our June issue attention was drawn to Dr Cobb's masterly demonstration of the superiority of large grain over small shrivelled grain for seed purposes; and of the advantage of purging our seed wheat of the light, inferior grain, which at present enters so largely into its composition. Dr. Cobb's experiments were conducted under a great variety of conditions, and extended over several seasons; his results are, without doubt, overwhelmingly conclusive. It is, however, no disadvantage to find the work of the New South Wales scientist confirmed by the work of others. In The Annales Agronomiques, 1896, the late P. P. Deherain quotes some experiments conducted upon somewhat similar lines by M. Desprez, in France. It will not be without interest to summarize them here.

For several years in succession M. Desprez selected the largest and the smallest grains of five different varieties of wheat. They were carefully sown, and the plants subsequently harvested separately. On each occasion the largest seeds, borne by plants themselves sprung from large seeds, were selected and reserved for seed; whilst the smallest seeds, borne by plants sprung from small seeds, were also similarly treated. The average results secured during 1893, 1894, and 1895 are summarized below:—

VARIETIES TESTED.	Average yield of Wheat per acre from heavy seed.		Average yield per acre of Wheat from light seed.		Average difference per acre in favor of heavy seed.	
	GRAIN	STRAW	GRAIN	STRAW.	GRAIN.	STRAW.
	Bushels	Cwt	Bushels.	Cwt.	Bushels	Cwt
1. Jaune Desprez Square Head (large seed - 0·83 grain, small seed = 0·46 grain)	71	79	44·9	51	26·1	28
2. Rouge Desprez (large seed = 0·85 grain; small seed = 0·52 grain) ..	60·2	69·9	44·6	50·5	15.6	19·4
3. Blanc à epi rouge (large seed = 0.9 grain; small seed = 0·55 grain)	62·7	74·6	46·5	57·8	16·2	16·8
4. French Fan Square Head (large seed = 0·93 grain; small seed = 0·5 grain)	77·5	84·9	50·4	66·6	27·1	18·3
5. French Long Square Head (large seed - 0·99 grain, small seed - 0·47 grain)	65·4	93·4	42·3	57·4	23·1	36
Average excess in favor of large heavy grain in whole series ..					21·6	23·7

The yields per acre are certainly not such as we are accustomed to; nor in fact, do they represent anything like averages for the most favoured countries. These yields were obtained probably from comparatively small plots upon which much labour and attention had been bestowed; the results, however, are comparable, and carry with them the confirmation of the lesson so ably imparted by Dr. Cobb. On the whole, the large seed returned in grain about 32 per cent. more than the small seed and 29 per cent. in straw. We have evidently here extreme cases: no farmer would ever dream of systematically sowing his smallest seed; nevertheless, the fact that small seed yields uniformly less than large seed is a strong argument in favour of excluding it as much as possible from our ordinary seed wheat. And this constant selection of good large seed cannot but tend to have an improving influence on our wheats as seed bearers.

It will not be out of place to notice here that it is quite possible that Dr. Cobb may be tempted to sever his connection with the New South Wales Department of Agriculture. He has recently received the offer of an important position in the Philippines, and should this new sphere of work be to his liking, we wish him all success, trusting at the same time that some effort will be made to retain in Australia one of the ablest and best qualified men in the various State Departments of Agriculture.

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POULTRY NOTES.

By D F. Laurie.

Judging at Country Shows and Lecturing.—I have received numerous letters lately asking me to judge at country shows and lecture. My official duties do not permit me to undertake work of this description, so I trust those who have been contemplating inviting me will make other arrangements It is not at all probable that I shall either judge again or lecture in the country. I shall be glad to help any one writing to me on poultry questions, selection of breeds, &c., and hope all will read the Poultry Manual written by myself for the Department of Agriculture, as that will save repetition.

School of Mines.—I have been lecturing at the School of Mines every Friday for some weeks, but find the attendance very small, so small that there is no inducement to continue. There are hundreds willing to ask me an infinitude of questions and get information regardless of the calls on my time, and yet are too indifferent to attend Most of those I refer to are well able to do so, and can benefit without doubt The fanciers have not responded, and yet it is to their interest to do so, and one would think ordinary business instincts would lead them to aid in promoting an industry which as it grows increases their profits. The Poultry Society and the poultry section of the R.A. and H Society should have helped. The Government for seven or eight years past has given each society £15 for prizemoney. A year ago two members of the committee of the S A. Poultry Society, oblivious of the Government aid, blamed the Government for their inaction, and yet, when lectures for the especial benefit of fanciers and breeders are arranged, they remain indifferent. I have for eight years devoted most of my spare time to the poultry question, and have written more than any other writer on the continent on poultry subjects, but I feel so disgusted with the general apathy that I am inclined to withdraw altogether. I have had all the work and no benefit, for I have done but little breeding and selling for years. As regards the egg-laying competition, I do not and never did regard such competitions as of any practical value, although I believe there will be more information than usual available in this case.

I see an incubator competition is being arranged—unless every machine on the market competes and under definite conditions, but little good will result. One has only to read advertisements to see that hardly an incubator is advertised which does not claim to have won all manner of prizes.

Poultry Shows.

The S.A Poultry and Kennel Club's show is just over, and was undoubtedly the best show from all points of view that has been seen in Adelaide. In many respects it was equal, and in some better than, the large shows in the other States. The committee and secretary are to be congratulated on their very complete arrangements, and although the show was financially a great success, still the general public did not attend as they should.

The feature of all modern shows is the enormous increase, both in numbers and quality, in those sections devoted to the utility classes. I think I may fairly claim to be the first writer in Australia to bring out the merits of certain pure breeds as utility breeds, and to impress the importance of breeding the stock to the greatest perfection, having especial regard for the development of the utility points and charactristics.

My advocacy of the Dorkings caused a revival, and Messrs. Osborne and Waterhouse showed a grand lot; and later, on my initiative, the Boys' Reformatory imported stock which has ever since been in front. The Orpington I described years ago, and pointed out the value of the Minorca-Langshan cross (a partly formed Orpington). For advocating the Indian game, now recognised as of great value for table bird production, I was "reported," and accused of booming "game," that is, modern game. The Wyandottes, which are the most profitable and popular fowls of the day, I championed strongly amidst many expressions of strong dissent (vide former numbers of Journal, &c.). The old English game I have introduced are so evidently the right class of bird we want that so far only a few envious remarks have been made.

The Campine is a grand layer and a handsome bird, though possibly some who do not know it will think it a fancy fowl. These classes were large and made up of grand specimens, the worst of which would have won three or four years ago.

I stated the other night at the School of Mines that Mr. Edward Brown, an English authority, had proved that the introduction of a better class of fowls on the farms in England had between the years 1890 and 1900 raised the average egg production in England per hen 20 eggs. A similar increase here would mean from £15,000 to £20,000 addition to our egg exports, and this result may easily be brought about, and still better.

Poultry shows of the day have a distinct interest to the producer, but the officials must remember that undue attention must not be given to merely fancy points. It must be remembered that to the true fancier and scientific breeder we are indebted for our grand modern breeds. The common, unprofitable mongrel is the result of ignoring the value of pure breeds, want of care in selection, and slipshod methods. The indiscriminate and purposeless crossing so often advocated can only result in chaos and failure. You must breed on definite lines for a purpose. Therefore, those whose interest is mainly centred in egg-production will be gratified to hear of the great increase in quality of the Leghorns, Minorcas, Andalusians, and Campines, which produce large white eggs, and the previously mentioned Wyandottes and Orpingtons, which lay so well, especially in the winter months, when eggs are dear.

Among the breeds new to the State is the Partridge Wyandotte, of which I introduced the first in January, 1902, by direct importation from a celebrated English breeder. I did not show the imported hen, as she was laying, but scored with a pullet I bred. My pen is the best pullet-breeding pen in Australia, and of course all the male birds have a few brown feathers in the breast, which in a show specimen should be black. For all that, there was no bird equal in type to my imported cock bird. I have arranged for a further addition of imported blood and have secured blood from the other winning strain (cockerel breeders), and shall have a few eggs to spare this year. Mine are grand layers, and the eggs of this variety are larger than average Wyandotte eggs.

There were some model poultry houses and yards on view at the show, and these attracted attention. The yards are portable and cheap. For the country, wattle hurdles 6 ft. high and 10 in length, covered with netting, will be found excellent There was a fine display of incubators, the Simplex, Petaluma, and Cyphers, also Mr. Paternoster's. I hear a trial will come off soon. Messrs. Anthony & Co. had a most interesting exhibit of poultry accessories on view—there were bone and grit mills, bonecutters, grasscutters (for green food), brooders, incubators, marking rings (for branding and distinguishing poultry), cut bone (dry and green), grit, meals, torrified barley, and a host of other items of interest and value to those connected with poultry keeping. For years I have regretted the absence of those necessaries, which add to the profit and pleasure of poultry keeping. Many people want cheap yet effective houses and yards and other items. These can now be obtained of modern pattern and as required and without any trouble.

NOTES.

Breeding operations should now be in full swing—early hatched chickens will bring satisfactory prices this year. Surplus eggs should be preserved as soon as laid, in a solution of waterglass, a supply of which should be obtained early.

THE ROYAL AGRICULTURAL AND HORTICULTURAL SOCIETY'S SHOW.

This will be held in September, and the schedules are now obtainable. All being well I hope to meet a lot of country friends thereat, and at a lecture I propose to give at the School of Mines on one of the nights of show week.

I have long advocated a table poultry show in connection with the R.A. and H. Society in March. Breeders should bear that in view, and urge the society to make arrangements, which they will do if they receive sufficient encouragement and definite promises.

SALT SOILS ON YORKE'S PENINSULA: AN ENQUIRY INTO THEIR POSSIBLE UTILISATION.

By Arthur J. Perkins, Secretary for Agriculture.

The attention of the members of the Yorketown Agricultural Bureau was recently drawn by Mr. C. Domaschenz to the "salt patches" with which much of the good arable land of the Peninsula is studded. In the opinion of most farmers, these patches, on many of which excellent wheat crops have in the past frequently been grown, have within recent years become stricken with permanent barrenness and lost all agricultural value. The presence of frequent barren patches in land that is otherwise of good quality is of itself sufficient to raise issues that may not be without influence on the agricultural prosperity of a district, but when to the fact of mere presence is added that of gradual, if slow extension, we find ourselves faced with a problem the seriousness of which cannot be overlooked. If through force of circumstances we find ourselves compelled to join hands with those who are inclined to look upon the barrenness as permanent, it is our duty to seek the causes that govern the spread of the salt, and to ascertain in what manner it may best be kept in check; if, on the other hand, we can prove the barrenness to be merely accidental and temporary, we have before us the further task of elucidating the best methods of reclaiming the patches that are at present lost to us. With our vast territorial possessions, the agricultural wealth of which has been barely touched, it may perhaps be asked—Why take thought over the loss of a few hundred acres of land? Setting aside the claim of the individual owners, to whom the loss may mean much, I conceive that, the extensiveness of its area notwithstanding, this State can ill-afford to lose an acre of ground within good average rainfall limit.

Mr. Domaschenz's experiments have therefore more than local interest, and I have thought it well that the Department should lend him a helping hand in the matter. During the past season, by a rough and ready method it is true he succeeded in proving that the barrenness of some of the salt land, at all events, is far from permanent. He cultivated two plots—one of which was tilled whenever the soil was moist, and subsequently sown to wheat after rain in June; the other was tilled dry and sown dry. The first plot germinated well, and yielded an average crop of wheat, whilst the second yielded absolutely nothing.

In this experiment I do not think that we should look for more than a simple proof of the want of permanency in the barrenness of these salt patches, which may, after all, under certain conditions carry fair crops of wheat. Without wishing at this stage to criticise Mr. Domaschenz's further conclusion, that working and sowing the land wet had had a special influence in neutralizing the deleterious action of the salt, I would point out that, without taking into account the possible action of the salt, dry tillage alone was sufficient to account for the failure in the second plot. The land is described as of too loose a nature to require ploughing; and, be it salt or not, such land should never be tilled dry. Let these remarks be considered as no more than parenthetical.

After reading an account of Mr. Domaschenz's experiment, I requested him to supply me with samples of the salt soil, with a view to an enquiry into the whole question. The samples were at my request taken from two distinct spots—on the first an 8-bushel crop of wheat had been grown during the past season; on the second nothing whatsoever had ever been sown, and the only plant that appears capable of eking out an existence upon it is the *Salicornia arbuscula*, commonly known as Samphire, a member of a natural order characteristic of salt country. In each case the samples represent respectively the first, second, and third 6 in. of soil. The analytical work connected with this matter has been carried out by Mr. Chapman, of the School of Mines.

State of Division of the Soil.

Let me point out at the outset that in investigations of this nature we are always handicapped by the absence of a Departmental Agricultural Chemist, by whom the analytical work could be conducted. For every estimation made we have to pay out of our ordinary contingencies' vote a fee to the School of Mines; the charges of this institution are unquestionably moderate; but our vote is exceedingly slender, and until an official laboratory connected with small experimental grounds has been called into existence, I shall not find myself in a position to more than skim over the various agricultural problems with which we are from time to time confronted. This by way of explanation why I have not been able to have carried out an analysis showing more definitely the mechanical state of the soils in question. This side of the question has its special interest, and it is quite possible that at a later date it may be necessary to investigate it further I have, however judged it necessary to show the proportion of fine earth in the various samples in view of the comparative inertness of coarse material. Figures having reference to this question are given in Table I.

TABLE I

Proportion of Fine Earth (passed through 1/50 inch sieve) in Air dried Samples of Yorke's Peninsula Salt Soils

Description of Sample	Percentage of Fine Earth in	
	Soil latterly under Wheat	Soil not previously under cultivation
	per cent	per cent
First 6 inches	90	97
Second 6 inches	65 3	82 2
Third 6 inches	56 2	73

It will be noted that except for the first six inches, coarse material is fairly abundant in both soils, but particularly in the one having previously carried wheat In referring to the acre the proportions of salts found present in the fine earth account must of course, be taken of this more or less inert but abundant coarse material.

SOLUBLE SALINE COMPOUNDS.

The substances likely to be injurious to plant growth, and coming under the popularly generic denomination of salt ' are all highly soluble in water It is, in fact in this their excessive solubility and consequent mobility within the soil that lies their power for evil Let us first endeavour to ascertain the nature and distribution of the salt in the soil latterly under wheat The proportions of the various substances detected in the water soluble extracts are shown in Table II.

TABLE II

Composition of Water soluble Extracts from Fine Earth of First 18 inches of Salt Soil latterly under Wheat, expressed in Percentage of Soil dried at 100° C

	First 6 inches	Second 6 inches	Third 6 inches
Chlorine	0 345	0 3180	0 1800
Sulphuric Acid (So_4)	0 043	0 1360	0 0500
Carbonic Acid (Co_3)	0 011	0 0165	0 0255
Calcium	0 058	0 0710	0 0060
Magnesium	0·009	0 0210	0 006[illegible]
Sodium and Potassium	0 166	0 1625	0 1450
Total Soluble Salts	0·632	0·7250	0 4185

In Table III is given what may be assumed to be the composition of these soluble salts, represented respectively as percentages of the fine earth and of the whole soil

TABLE III

Soluble Salts in Yorke's Peninsula Salt Soil recently under Wheat, expressed respectively as percentages of Fine Earth dried at 105°C and as Percentages of Total Soil

Soluble Salts	First 6 inches		Second 6 inches		Third 6 inches	
	Percentage in Fine Earth	Percentage in Total Soil	Percentage in Fine Earth	Percentage in Total Soil	Percentage in Fine Earth	Percentage in Total Soil
	per cent	per cent	per cent	per cent	per cent	per cent
Calcium Carbonate	0·003	0·0027	0·024	0·0157	0·012	0·0067
Sodium Carbonate	0·015	0·0135	0·004	0·0026	0·032	0·0180
Calcium Chloride	0·107	0·0963	0·011	0·0072	—	—
Magnesium Chloride	0·038	0·0342	0·083	0·0542	—	—
Sodium Chloride	0·408	0·3672	0·410	0·2677	0·306	0·1720
Calcium Sulphate	0·061	0·0549	0·193	0·1260	0·004	0·0022
Magnesium Sulphate	—	—	—	—	0·030	0·0169
Sodium Sulphate	—	—	—	—	0·034	0·0191
Total Salts	0·632	0·5688	0·725	0·4734	0·418	0·2349

If now, with a view to obtaining a more concrete idea of the amount of saline substances present, we convert the percentages of the total soil into pounds per acre on the assumption that one acre 1 ft deep weighs 3,250,000 lb, we shall obtain the results in Table IV

TABLE IV

Soluble Salts contained in Yorke's Peninsula Salt Soil recently under Wheat, expressed as Pounds per Acre in Total Soil

Salts	First 6 inches	Second 6 inches	Third 6 inches	First Foot	First 18 inches
	lbs	lbs	lbs	lbs	lbs
Calcium Carbonate	43·9	255·1	108·9	299·0	407·9
Sodium Carbonate	219·4	42·2	292·5	261·6	554·1
Calcium Chloride	1,564·9	117·0	—	1,681·9	1,681·9
Magnesium Chloride	555·7	880·7	—	1,436·4	1,436·4
Sodium Chloride	5,967·0	4,350·1	2,795·0	10,317·1	13,112·1
Calcium Sulphate	892·1	2,047·5	35·7	2,939·6	2,975·3
Magnesium Sulphate	—	—	274·6	—	274·6
Sodium Sulphate	—	—	310·4	—	310·4
Total Soluble Salts	9,243·0	7,692·6	3,817·1	16,935·6	20,752·7

A cursory examination of Table IV is not calculated to convey the impression that the soil under consideration is in its present condition well fitted to the growth of plants For, if from the total soluble salts, we deduct the figures having reference to the wholly innocuous calcium carbonate and calcium sulphate, we still have per acre in the first 6 in of soil 8,307 lb., in the second 5,390 lb, and in the third 3,672 lb, making a total for the first 18 in of 17,369 lb. of substances that in moderate state of concentration experience has shown to be distinctly harmful to practically all forms of cultivated plants. Mr. Domaschenz expressed the opinion that the apparent barrenness of the land was probably not caused by the presence of an excess of common salt. The analysis does not, however, support this view; the chlorides, in fact, predominate almost to the exclusion of other injurious salts, such as magnesium sulphate, sodium carbonate, &c.; and among them sodium chloride (common salt) alone is present in quantities sufficient to account for the present unsatisfactory state of the soil. Without at present wishing to enter into details on this question, I would draw attention to the clear demonstration we have in Table IV. of the tendency to accumulate in the surface layers evinced by soluble salts. And when in this connection the extreme sensitiveness of germinating seeds to the influence of saline compounds is borne in mind, it will be comprehensible how in certain circumstances a relatively small amount of salt may reduce a good soil to apparent barrenness.

From the soil latterly under wheat we may now pass on to a consideration of the saline substances present in the soil that has not as yet come under the disturbing influence of the plough. Mr. Chapman indicates the composition of the water soluble extract in Table V.

TABLE V.

Composition of Water-soluble Extracts of Fine Earth in first 18 inches of Yorke's Peninsula Salt Soil never previously cultivated, expressed as Percentages of Soil dried to 105° C.

	First 6 inches.	Second 6 inches.	Third 6 inches.
Chlorine	0·7420	0·5340	0·3680
Sulphuric Acid (So_4) ..	0·3290	0·4800	0·5660
Carbonic Acid (Co_3) ..	0 0126	0·0138	0·0097
Calcium ...	0·1370	0·1530	0·1770
Magnesium	0·0090	0·0320	0·0300
Sodium and Potassium .	0·4730	0 3490	0·2550
Total Soluble Salts	1 7026	1·5618	1·4057

In Table VI. is shown the assumed composition of the salts expressed respectively as percentages of the fine earth and of the whole soil.

TABLE VI.

Soluble Salts assumed to be present in Yorke's Peninsula Salt Soil not previously cultivated, expressed respectively as Percentages of the Fine Earth dried to 105°C. and of the Whole Soil.

Salts.	First 6 inches.		Second 6 inches.		Third 6 inches.	
	Percentage of Fine Earth.	Percentage of Whole Soil.	Percentage of Fine Earth.	Percentage of Whole Soil.	Percentage of Fine Earth.	Percentage of Whole Soil.
Calcium Carbonate ..	0·003	0·0029	0·015	0 0123	0·011	0·0090
Sodium Carbonate ...	0·019	0·0184	0·009	0·0074	0·005	0·0036
Magnesium Chloride	0·032	0·0310	—	—	—	—
Sodium Chloride ...	1·183	1·1475	0·879	0·7225	0·606	0·4424
Calcium Sulphate ...	0·462	0·4481	0·500	0·4110	0·588	0·4282
Magnesium Sulphate	0·004	0·0039	0·159	0·1307	0 150	0·1095
Sodium Sulphate ..	—	—	—	—	0·046	0·0336
Total Salts ...	1·703	1·6518	1·562	1·2839	1·406	1·0263

The centesimal proportions of soluble saline compounds in the total soil converted into pounds per acre are shown in Table VII.

TABLE VII.

Soluble Salts contained in Yorke's Peninsula Salt Soil not previously cultivated, expressed as Pounds per Acre in Total Soil.

Salts		First 6 inches.	Second 6 inches.	Third 6 inches.	First foot.	First 18 inches.
		lbs.	lbs	lbs.	lbs	lbs.
Calcium Carbonate	...	47·1	199·9	130·0	247·0	377·0
Sodium Carbonate	...	299·0	120·2	58·5	419·2	477·7
Magnesium Chloride	...	503·7	—	—	503·7	503·7
Sodium Chloride	...	18,646 9	11,740·6	7,189·0	30,387·5	37,576·5
Calcium Sulphate	...	7,281·6	6,678·7	6,974·5	13,960 3	20,934·8
Magnesium Sulphate	...	63 4	2,123 9	1,779 4	2,187·3	3,966·7
Sodium Sulphate	.	—	—	546·0	—	546·0
Total Salts	.	26,841 7	20,863 3	16,677·4	47,705 0	64,382·4

We have in the soil not previously under cultivation heavier quantities of injurious salts than in the soil latterly under wheat After deduction from the total soluble salts of calcium carbonate and calcium sulphate, both of which, as has already been stated are innocuous, we still have per acre in the first 6 in of soil 19.513 lb. of dangerous saline matter; in the second 6 in., 13.984 lb., and in the third 6 in 9.573 lb., making a total for the first 18 in. of over 43,000 lb per acre, against 17.369 lb in the soil that carried wheat with a fair amount of success during the past season. Again, whilst we certainly find higher proportions of sodium carbonate, and particularly of magnesium sulphate, in the soluble salts of the second soil, still, as in the first case, the bulk consists of sodium chloride, or common salt

Mr. Domaschenz expressed the opinion that working the salt soil wet, followed on by rain, had the effect of washing down the injurious substances into the lower strata of the soil. Whilst I am not prepared to dispute this view in fact, my own opinion largely coincides with it—it should be noted how fleeting, under conditions that usually obtain in our fields, such a beneficial change is likely to be. In Table VIII we have recorded the distribution of the total soluble salts found in the first 18 in. of soil over successive 6 in.

TABLE VIII

Distribution of Total Soluble Salts in first 18 inches of two Yorke's Peninsula Salt Soils over successive 6 inches.

Depths.	Proportion of Saline Matters in	
	Soil under Wheat last Season	Soil not previously cultivated
	per cent	per cent.
First 6 inches	44·5	41·7
Second 6 inches	37·1	32·4
Third 6 inches	18·4	25·9
First foot	81·6	74·1

It will be noted that, if anything, there is a more marked concentration of "salt" in the surface layers of the soil latterly under wheat than in the one never previously broken-up. To this objection it may be replied that the soil samples were taken some considerable time after harvest, and that in the interval capillarity and surface evaporation will have brought to the surface what winter rains may have taken in to the lower layers. It is probable, too, that the ascent of salt under the influence of these two agencies is likely to be more rapid and more pronounced when once a soil has been broken up, and better provision has been made for the penetration of rain water, than when left with its natural hardened surface, through which but an infinitesimal portion of rain water can under ordinary circumstances penetrate.

I have dealt with the nature, proportions, and distribution of these injurious soluble salts. I reserve for future articles further remarks on the possible utilisation of these apparently barren soils.

(To be continued.)

PASTURE FOR HOGS.

The Kansas Experiment Station has realised $11.90 per acre from rape pasture and $24.10 from alfalfa pasture in 98 days. These results were obtained from the following experiments, which were begun July 25 and concluded October 31, 1902:—

Thirty shoats, averaging 52 pounds in weight, were divided as nearly equally as possible into three lots of 10 each. Lot 1 was fed on a grain mixture of shorts one-half, cornmeal one-fourth, and Kaffir-corn meal one-fourth, in a dry lot. The other two lots were fed the same grain ration, but one received rape pasture and the other alfalfa pasture in addition. Each lot was given what grain the hogs would eat up clean, and each had access to water and ashes. The weights of grain consumed and gains made are as follows:—

	Grain consumed in lbs.	Total gain in lbs	Grain consumed per 100 lbs gain in lbs
I. No pasture	3,801	1,023	371
II. Rape pasture	3,244	1,076	301
III. Alfalfa pasture	3,244	1,078	300

The gains of the three lots are very nearly equal. The dry lot consumed 577 pounds, or 70 pounds for every 100 pounds of grain, more grain than the pasture lots. The lot on rape required one acre of pasture, while the alfalfa lot used a trifle less than one-half acre.

The lot without pasture required 3.71 pounds of grain, to produce one pound of gain. Assigning the same value to the grain fed the hogs on rape pasture, we have 877 pounds of pork credited to the grain and 199 pounds credited to the rape. At six cents per pound, the price at which hogs were selling at the close of the experiment, this would be a credit of $11.90 per acre for the rape. In a similar manner, the alfalfa is credited with 201 pounds of pork, equal to $12.05, and as there was only a half-acre of alfalfa this makes a rate of $24.10 per acre.

The cost of preparing the seedbed and seeding the rape was $1.80 per acre. It was seeded in the feed lots on soil that would otherwise have remained idle, or would have grown up to weeds.

The shoats on pasture enjoyed their diet and seemed satisfied. Those in the dry lots seemed to be hankering after something green, and their appetites seemed unsatisfied without some kind of roughness. They would even nibble at straw in a vain attempt to satisfy their craving.

The experiment emphasises the superior value of alfalfa pasture. Where alfalfa is not available, or where variety is wanted or it is desired to utilise otherwise waste land, Dwarf Essex rape, seeded at the rate of six to eight pounds per acre any time from early spring to late summer, will furnish an excellent diet that is greatly relished by the hog. Succulence and variety will make healthier hogs that will return increased profits.

D. H. Otis, Kansas Agricultural College.

PRODUCE EXPORT DEPARTMENT.

By R. W. Skevington.

The anticipations of a good season after the unfavourable conditions experienced during the past few years will again draw producers' attention to outside markets for their surplus produce, and the month of August will inaugurate what promises to be a very busy time for the department. Lambs for export have only been obtainable in the most favoured districts during the past two years, and the amount of butter made in the State has not more than supplied the local demand. This year's export of lambs should be a record one, and it is the general opinion that the butter export trade will nearly equal that of 1900, when some 300 tons were shipped from South Australia.

Farmers who anticipate trying the London market for themselves should make early applications to the department so that receiving and shipping arrangements can be made. One thousand seven hundred and sixty lambs were sold through the London Depot last year, and the net return, including skins and fat was 12/11 per lamb. The average weight was nearly 33 lb., and the total charges for receiving, chilling, shipping, and selling amounted to 1½d. per lb.

Shipments of butter through the department will have the special advantages of the Government "Approved for Export" brand, and a detailed report of the Dairy Expert's examination will be supplied each shipper. The proximity of the depot to the wharf reduces the handling to a minimum, and the use of the refrigerated lighter for transhipment at anchorage gives the department the advantage of placing butter on board steamers under the best possible conditions. The department will undertake the sale of consignments for shippers having no agents in England. The receiving, chilling, and shipping charges are 3d. box and 1/0 ton measurement wharfage, freight ½d. per lb., and selling charges should not be more than 5 per cent.

For fuller particulars apply to the Manager.

FARM AND DAIRY PRODUCE MARKETS REVIEW.

Messrs. A. W. Sandford & Compy. report on August 1, 1903:—

The rainfall during July has not by any means been of such a general character as that of the preceding month, for whilst Adelaide and southern districts can record nearly an inch above the average, the far northern agricultural areas and eastern districts only report light fall, accompanied with frosty conditions, which have temporarily checked the growth of herbage in those parts; but, taking it all round, farming prospects are good.

Since our last there there has been nothing phenomenal to report in business circles, and, whilst trade is sound, the volume of sales put through has only been of an ordinary type. Although most of the mines at Broken Hill have resumed operations, the continued absence of rain is felt to be now even more serious, as it is feared a shut down of the big mines is almost certain; but, to assist as far as possible, special trains from South Australia are delivering water to help to supply household and mining purposes. We are pleased to find further improvement in Silver quotations. Lead keeps fairly steady, but Copper still seems on the downward trend.

Advices by the mail state that Breadstuffs in the European markets are firmer in tone, in consequence of hardening prices in America, caused by the unsatisfactory wheat harvest now being reaped. The winter sowings have been damaged by drought, whilst the spring Wheat has suffered from too much rain. In the local market but few transactions have been reported during the month, and only a very small delivery of Wheat has been made by farmers. Some of the up-country districts appear to have been quite cleaned out, as the millers there are buying Argentine Wheat in Port Adelaide and having it sent up by rail. American flour is coming here in considerable quantities, the best brands of Manitoba being delivered to bakers slightly under the local millers' quotations, while inferior makes are selling at lower prices. The Melbourne and Sydney markets are both reported firmer as regards Wheat, but there are very anxious sellers of imported flour at rates which leave a heavy loss to importers. The Offal market has been very dull, and sales of Bran were made as low as 11½d., but values are now better, and as many mills are shutting down holders are asking an advance. Pollard is in better demand, and firm at quotations. During the early part of the month some activity was caused in Forage lines owing to Sydney again purchasing Chaff in this market, but with Victoria now quoting lower things in the line have again toned down. Oats.—Enquiry being slow, no large parcels have changed hands during the month. Quotations for Cape Barley are only nominal.

The month's business in potatoes has been fairly heavy, with Western Australia continuing to operate freely on "Gambiers;" and, with several large shipments for the Sydney market, values have, at any rate, been sustained; but no quotable alteration to report. Local grown onions are now exhausted, but with Gambiers plentiful and sales quiet prices show a slight easing.

In Dairy Produce the pleasing feature has been the steady increasing quantities coming forward, especially in Butter, the catalogues submitted being heavier than corresponding months for several years, and with buyers much preferring the new made fresh in prints to the stored bulk that they have been using, prices have been wonderfully sustained; but we must shortly look for outside markets to absorb the surplus that is imminent. Eggs have fluctuated in value until 1/8½ loose was touched, but have eased considerably since then, and it is reckoned that the seasonable downward trend in rates has quite set in. Bacon.—With Western buyers operating more strongly on this market, factory-cured sides have been meeting with better sale, and although no improvement yet to report in values, the tone at present is decidedly firm. Hams steady. Cheese.—Good makes to prime have commanded attention, but medium and poorer quality, as usual, hard to quit. Fair-sized parcels of Honey have been disposed of for shipment to the Eastern States. Beeswax selling. Almonds show a slight hardening.

Throughout the month there has been a good market for well-conditioned carcass Pork and Veal, and a steady advance in price at later sales.

In live Poultry the bidding is keen, and satisfactory figures secured for all pens of good birds.

Market Quotations of the Day.

Wheat.—At Port Adelaide, shipping parcels, 5/6 f.o.b.; farmers' lots, 5/5 on trucks, per bushel 60 lb.

Flour.—City brands, £12 5/ to £12 10/; country, £11 15/ to £12 per ton 2 000 lb.

Bran —1/; pollard, 1/2 per bushel of 20 lb.

Oats —Local Algerian and Dun, 2/6 to 2/8; white champions, 2/7 to 2/9 per bushel 40 lb.

Barley.—Malting, 4/2 to 4/6; Cape, 3/ to 3/3 per bushel 50 lb.

Chaff.—£5 5/ to £5 10/ per ton of 2,240 lb., bags in, f.o.b., Port Adelaide.

Potatoes.—Gambiers, £2 10/ per 2,240 lb.

Onions.—Gambiers, £2 7/6 per 2,240 lb.

Butter.—Creamery and factory prints, 11d. to 1/1; private separator and best dairy, 9½d. to 11d.; well graded store, 7d. to 9d.

Cheese.—S.A. best factory, 7d to 7¾d.; ordinary, 5d. to 5½d. per lb.

Bacon.—Factory cured sides, 7½d to 8d.; farm flitches, 7d. per lb.

Hams.—S.A. factory, 9d. to 9½d. per lb.

Eggs.—Loose, 1/2½; in casks, f.o.b., 1/4 per dozen.

Lard.—In bladders, 6½d. to 7d.; tins, 5d. to 6d. per lb.

Honey.—2¾d. for best extracted, in 60-lb. tins; beeswax, 1/ lb.

Almonds.—Fine soft shells, 5½d.; kernels, 11½d. per lb.

Carcass Meat.—Bright shop porkers, 5d. to 5¾d. per lb.; fair porkers to good baconers, 4½d. to 5d.; choppers, 2½d. to 3½d.; prime veal, 3d. to 4d.; poor and light weights, from 1d. to 2d.

Poultry.—Dressed turkeys, 7d. to 7½d. per lb.; fowls, 6d. to 6½d. In live birds, heavyweight table roosters worth 2/ to 2/6 each; plump hens and fair conditioned cockerels, 1/3 to 1/9; poor and light, 10d. to 1/; ducks, 1/10 to 2/10; geese, 2/9 to 3/6; pigeons, 6d. to 6½d.; turkeys, from 5d. to 6½d. per lb., live weight, for fair to good table sorts.

Above quotations, unless when otherwise specified, are duty-paid values on imported lines. Grain, flour, and forage for export are f.o.b. prices at Port Adelaide. Dairy products are city auction mart rates. In grain, chaff, and potatoes sacks are included, but weighed as produce. Packages free with bulk butter and cheese.

MONTHLY RAINFALL.

The following table shows the rainfall for the month of July, 1903 :—

Adelaide	3·47	Manoora	1·63	Echunga	4·82
Hawker	0·77	Hoyleton	1·45	Macclesfield	5·19
Cradock	0·70	Balaklava	1·60	Meadows	5·92
Wilson	0·66	Port Wakefield	1·27	Strathalbyn	2·38
Gordon	0·51	Saddleworth	1·61	Callington	2·85
Quorn	1·37	Marrabel	1·85	Langhorne's Bridge	1·46
Port Augusta	0·55	Riverton	1·75	Milang	1·91
Port Germein	0·99	Tarlee	1·14	Wallaroo	2·50
Port Pirie	1·10	Stockport	1·46	Kadina	2·56
Crystal Brook	1·58	Hamley Bridge	1·52	Moonta	2·78
Port Broughton	1·81	Kapunda	2·30	Green's Plains	2·26
Bute	2·42	Freeling	1·64	Maitland	2·63
Hammond	0·65	Stockwell	2·29	Ardrossan	1·48
Bruce	0·75	Nuriootpa	2·90	Port Victoria	1·93
Wilmington	2·15	Angaston	3·13	Curramulka	3·15
Melrose	2·71	Tanunda	2·73	Minlaton	1·92
Booleroo Centre	1·59	Lyndoch	2·46	Stansbury	2·94
Wirrabara	2·02	Mallala	1·19	Warooka	3·42
Appila	1·17	Roseworthy	1·58	Yorketown	2·80
Laura	1·70	Gawler	1 82	Edithburg	2·85
Caltowie	1·67	Smithfield	1·75	Fowler's Bay	2·71
Jamestown	1·62	Two Wells	1·23	Streaky Bay	2·54
Gladstone	1.55	Virginia	1·51	Port Elliston	4·11
Georgetown	2·09	Salisbury	2·44	Port Lincoln	2·62
Narridy	2·03	Tea Tree Gully	3·43	Cowell ...	0·77
Redhill	3·04	Magill	4 19	Queenscliffe	2·04
Koolunga	1·87	Mitcham	3·67	Port Elliot	2·03
Carrieton	0·67	Crafers	7·61	Goolwa	1·96
Eurelia	0·90	Clarendon	5·33	Meningie	1·76
Johnsburg	0·75	Morphett Vale	2·78	Kingston	3·78
Orroroo	1·44	Noarlunga	2 74	Robe	2·94
Black Rock	1·08	Willunga	3·69	Beachport	4·29
Petersburg	0·94	Aldinga	2·49	Coonalpyn	1·92
Yongala	0·93	Normanville	2·56	Bordertown	2·27
Terowie	1·01	Yankalilla	2·39	Frances	2·71
Yarcowie	0·94	Eudunda	0 43	Naracoorte	2·64
Hallett	1·77	Truro	0·69	Lucindale	2·54
Mt. Bryan	2·48	Palmer	0·27	Penola	3·96
Burra	2·19	Mount Pleasant	3·70	Millicent	4·96
Snowtown	1·59	Blumberg	4·00	Mount Gambier	4·25
Brinkworth	1·43	Gumeracha	4·45	Wellington	1·12
Blyth	1·14	Lobethal	6·89	Murray Bridge	1·04
Clare	2·29	Woodside	5·63	Mannum	0·65
Mintaro Central	3·06	Hahndorf	5 95	Morgan	0·21
Watervale	3 53	Nairne	4 20	Overland Corner	0·55
Auburn	2·05	Mount Barker	5·81	Renmark	0·74

AGRICULTURAL BUREAU REPORTS.

Gawler River, June 5.

Present—Messrs. Parker (chair), Kreig, H. and F. Roediger, Spencer, Hillier, Leak, Bray (Hon. Sec.), and two visitors.

Cows Eating Afterbirth.—In reply to question whether any ill-effect resulted from cows eating the afterbirth, members had not noticed any, but it was the general practice to remove the afterbirth as soon as it is found. In cases where the afterbirth was retained, Mr. Parker suggested a tablespoonful of turmeric in thin gruel as a drench; in stubborn cases it might be advisable to insert the hand, after first paring the nails and greasing it, and remove the afterbirth.

Horses Hanging Back.—Mr. Leak recommended as a cure for horses hanging back, to place the line around the girth and through the headstall. After one or two attempts the horse will quickly recognise the futility of its efforts. Members consider it advisable to get foals thoroughly accustomed to being tied up and handled, as they would then give very little trouble later on.

Copra Cake for Pigs.—Mr. Roediger stated that from his experience he considered copra cake of better value than pollard, weight for weight, in fattening pigs. One member stated that he found it too fattening for laying hens.

Woolundunga, June 15.

Present—Messrs. Prosser (chair), Greig, Walker, Aldenhoven, Bently, and Rogers (Hon. Sec.).

Codlin Moth.—Considerable discussion took place on the sale of codlin moth infested apples in this district. The Chairman stated that he had purchased a case of apples, and more than half the fruit was infested. Most of the members contended that the sale of such fruit should be prohibited, and it was resolved to call the attention of the local fruit inspector to the matter.

Rugging of Cows.—Members considered this practice unnecessary in this district.

Hay from Manured Land.—Mr. Aldenhoven called attention to report from Eudunda branch on this subject. Unless the growth was too rank, the hay from manured land would be as good if not better than from unmanured land; hay grown on irrigated land was often inferior. Mr. Prosser had found that the hay grown on this side of the range was apparently of better quality than hay from districts to the south. It was suggested that, although the growth was not so strong, the hay contained more saccharine matter.

Naracoorte, June 13.

Present—Messrs. Schinckel (chair), Duffield, Forster, Buck, McLay, Wynes, Coe, and Caldwell (Hon. Sec.).

Officers.—Messrs. J. G. Foster and S. Schinckel were appointed Chairman and Hon. Secretary respectively for ensuing year, a hearty of vote of thanks being accorded to the retiring officers.

Impaction in Cattle.—Mr. Wynes stated that during his recent trip to Victoria he had had conversation with a number of cattle owners concerning the complaint known as impaction, and so far as he could gather the general opinion was that the complaint had not yet been satisfactorily diagnosed, and that the food was not the cause of trouble.

Hay from Manured Land.—The Chairman and Mr. Schinckel expressed surprise that any doubt had been cast on the quality of food grown on land manured with phosphates, their experience having shown that stock did better under such circumstances.

Rugging Cows.—Members had found the benefit of rugging horses during the cold weather, and generally agreed with the statement that similar treatment of cows would prove financially beneficial. The better the cows were looked after the more profitable would they be.

Holder, June 12.

Present—Messrs. Rowe (chair), Blizard, Vaughan, Rogers, Perry, Jones, Rossiter, Green, Pickering, Jaeschke, F. and H. Starr (Hon. Sec.), and three visitors.

Economy in Vine Planting.—Mr. Rowe read paper, by Mr. W. H. Harrison, of Renmark, on this subject, dealing mainly with a system of continuous cordon. Most members thought the gain in fruit would not pay for the extra trouble of cultivation, cross-cultivation not being possible under this method.

Pruning Demonstration.—On June 20 Mr. S. McIntosh held a pruning demonstration under the auspices of the branch. He described the characteristics of the various kinds of trees, and pruned some of each sort, explaining why he removed certain branches, and why others were left. Vines were also treated, and a hearty vote of thanks was accorded to Mr. McIntosh for the very valuable instruction afforded the visitors.

Stansbury, June 13.

Present—Messrs. Anderson (chair), Faulkner, Henderson, Sherriff, Pitt, Cornish (Hon Sec.), and one visitor.

Woolclassing—Arrangements were made for resumption of class under supervision of Mr G. Jeffrey.

Membership.—Mr. P. Anderson tendered his resignation, which was accepted with great regret Mr. Anderson was one of the foundation members, and for the past 15 years has taken an active part in the work of the branch.

Farm Economy.—Mr. Cornish read a paper on "Farm economy." Notwithstanding the high prices obtainable for wheat and other farm products, and the talk about the farmers growing rich, he considered economy on the farm just as necessary now as formerly; it was only in a few instances, and under very favourable circumstances, that farmers were growing rich. It was true that the use of seed drills and fertilisers had given an impetus to farming, and that the outlook was better than was the case a few years ago, but at the same time it must not be forgotten that the use of manures involves considerable outlay, and farming is more expensive, and requires more brainwork than formerly. It was only by careful attention to his business, and keen foresight combined with economy, that the present day farmer is going to keep moving. To be successful, a farmer must have up-to-date implements and machinery; it is not economy to refrain from the necessary outlay and use old and unsuitable tools. Economy lies in the selection of implements best suited to the requirements of the farm, and in looking after them properly. On different farms different classes of implements will be necessary; a farm consisting of light sandy soil free from stumps and stones can be worked with much lighter machinery than required for stiff land, or land rough with stumps and stones. It was poor economy to purchase more machinery than really needed, or to neglect what is purchased. Exposure to sun and rain will take more out of the machinery than actual work. Provide good shelter, and give a coat of paint occasionally. The farmer should keep only such stock as required on the farm, and these should be of good quality. A lot of useless animals only eat up the feed to no good purpose. Feed the stock well, and rear a few good foals to replace those that become useless. Do not keep more sheep than can be profitably carried; it was poor policy to have half-starved animals of any sort on the farm. A few good pigs and poultry should be kept, and where possible grow some vegetables and fruit for the house. In the working of the farm it was the best economy to do the work well; a "lick and a promise" were entirely out of place here. Economy consists in getting the biggest return per acre, and not in getting the largest area under crop at the least outlay. Use only the best seed, purchase the manures most suitable to the soil even if dearer than other brands, and keep the land in good heart. Do not forget to grow plenty of hay, and save all the feed possible. Store the wheat chaff carefully, as stock will be glad of it in the winter. Grow all the produce you can on the farm, and avoid unnecessary outlay.

Boothby, June 16.

Present—Messrs. Foulds (chair), Way, Chaplin, Sims, Turnbull (Hon. Sec.), and one visitor.

Prevention of Bush Fires.—Mr. Carn forwarded paper on this subject. In dealing with the prevention of bush fires much depends upon the season. Last year it would have required a much narrower break to stop a fire than would have been necessary the previous year owing to the amount of vegetation. With plenty of grass, the best plan, in his opinion, was to harrow a strip a chain in width all around the paddock until it is like an ashbed. Not only is the strip cleared of grass, but the loose soil will settle on the grass and stubble alongside, and will assist in preventing the fire from crossing the break. Another good plan was to plough round the paddock as close to the fence as possible, then plough another round about a chain away, and burn in between the furrows. He considered the shovel the best implement for beating out a fire; some preferred green boughs, some wet bags, but he found neither equal to the shovel. The smouldering embers can be covered up with a shovel thus lessening the nuisance from smoke, which was one of the greatest of the firefighter's troubles. Members generally agreed with the writer of the paper.

Bots in Horses.—Mr. Sims read a short paper on this subject, but members have little or no experience with this trouble.

Stallion Tax.—Opinions differed on this question, some members holding that a standard of size and pedigree as well as of soundness would be adopted. Members would like to know if this would be the case. [It is not possible to say, but the proposal in the past has been to deal merely with the question of soundness The questions of size and pedigree can easily be settled by the breeder, who would not, however, be able to determine whether the animal offered for hire suffers from any hereditary defects which would make him unsound.—Ed.]

Backbands for Horses.—Members were unanimously of opinion that horses would work longer and more comfortably if backbands were used, as they keep the draught more off the point of the shoulder, and make walking much easier.

Brinkworth, July 3.

Present—Messrs. Everett (chair), Aunger, Coombe, Ottens, Jericho, Wooldridge, Hill, Russell, Stott (Hon. Sec.), and one visitor.

Poultry.—Mr. Hill initiated a discussion on poultry for farmers, by reading extracts from Mr. D. F. Laurie's "Poultry Manual." Mr. Hill could recommend both Wyandotte and Orpington as good winter layers and good table birds. Mr. Coombe considered poultry should be more profitable to the farmer than to the suburban resident. Mr. Everett thought rearing chicks all through the year would result in having eggs right through the year. Mr. Stott read extracts from The Australasian dealing with poultry. It was decided to endeavour to effect an improvement in the poultry of the district by securing a number of sittings of eggs from the egg-laying competition now in progress at Magill.

Port Broughton, July 3.

Present—Messrs. Whittaker (chair), Excell, Button, Dennis, Dolling, Pattingale, Harford, Tonkin, Dalby, Bates, and Barclay (Hon. Sec.).

Officers.—Messrs. J. Harford, G. E. Pattingale, and W. Dalby were elected Chairman, Vice-Chairman, and Hon. Secretary respectively, the retiring officers being thanked for their services.

Homestead Meeting.—Members met at residence of Mr. W. R. Whittaker, and after formal business had been disposed of the meeting took the nature of a social gathering.

Narridy, July 4.

Present—Messrs. Darley (chair), Flavel, Kelly, Liddle, E. and W. R. Smart, Satchell, and Dunsford (Hon. Sec.).

Early Wheat.—Mr. Satchell has a crop of Petatz Surprise wheat 3 ft. 6 in in height and out in ear. Unpickled seed was sown on March 7 and the land had been cropped for 11 years in succession without any manure being applied. Members thought unpickled seed germinated better and grew stronger than pickled seed, but considered it unsafe to sow without pickling.

Officers.—Messrs. R. H. Satchell and T. Dunsford were elected Chairman and Hon Secretary for the ensuing year.

Wilson, July 11.

Present—Messrs. W. N. Neal (chair), W. H. Neal, jun., Coombs, Crossman, O'Grady, Nelson, Sexton, Need, Ward, and Smith (Hon. Sec.).

Destroying Weeds in Crops. Discussion took place on best method of destroying "squash bush" in the wheat crops. Mr. Need was harrowing twice, and believed he was destroying two-thirds of the weeds. Mr. Coombs tried harrowing without success, and had cleared 20 acres by handpicking. Some members thought rolling would destroy the weed. This "squash bush" is very prevalent in the crops this year.

Minlaton, June 27.

Present--Messrs. Martin (chair), Anderson, Correll, Teichelmann, Vanstone, Twartz, Newbold, and A. and J. McKenzie (Hon. Sec.).

Conference.--It was decided to arrange for a conference of Yorke's Peninsula branches at Minlaton on August 12

Pickling Wheat Mr. Teichelmann showed wheat plants grown from grains cut in half and the germ end pickled in bluestone solution and then sown The experiment showed that while the germ, or eye, was undamaged pickling did not prevent germination

Dairying.- Mr. E. Correll read a paper on this subject. He had taken this matter for his paper because it was not likely any of the other members would do so, and because dairying did not receive the attention it should in this district. If carried on under systematic lines dairying can be made one of the most profitable branches of farm work. The objection is raised b. many in these parts that the cows soon die of impaction, or dry bible. Now, he was convinced that this complaint can be prevented by proper feeding. Give a variety of food that will supply the elements necessary to building up and maintaining a healthy body These elements are not supplied in the field- devoid of their natural grasses and herbs characteristic of most of our wheatgrowing areas. He was greatly surprised at the opinion of some members of Eudunda Branch that hay from manured land was not so nutritious as hay from unmanured land. Suitable manures were as essential to healthy growth of plant life as suitable foods were to animal life. Years of observation had convinced him that this was so, and he was very pleased with paper in May issue of The Journal of Agriculture by Mr. T. H. Williams, of Mount Gambier. To those farmers who say they have no time to attend to the cows he would say -it pays to make time and to give wheatgrowing, at prices prevailing in average seasons, a rest. In starting operations care should be taken to get the best cows available, and to keep on weeding out those that do not come up to a profitable standard. It was no more trouble and far more profitable to look after a good cow than it is to keep a bad one. The Babcock test should be used to find out which cows give poor milk, and the yields of each cow kept to determine which were paying. Comfortable and roomy milking sheds must be provided where they can be bailed up and fed. There was neither pleasure nor profit in dealing with the cows in a dirty yard exposed to cold, rain, or dust as the case may be. To get the best results the most scrupulous cleanliness must be observed. It was no credit to our dairymen that so much inferior butter was sent to market. Much of the loss due to the manufacture of inferior butter would be prevented if people would only grasp the fact that the same milk that produces the worst butter would, if properly handled, produce butter of the highest quality. The separator should be used where the milk is not sent to the factory or otherwise disposed of. The practice of mixing sweet with sour cream or warm cream with cold cream must be avoided. The fresh cream can easily be cooled by placing the can, covered with a wet flannel, in a shady place where there is a good draught. A water bag hung over the can so that the drip falls on the flannel will be found useful. Cream can easily be cooled down to 62 degrees F., or even less by this method. Churning should be stopped when grains about the size of a pin's head form, the buttermilk drawn off, and the butter washed and salted with as little working as possible consistent with all the water being expelled and the salt well mixed into the butter. Never handle the butter in the process; wooden pats, which should first be dipped in scalding water to prevent sticking, should be used. The butter should be got up in as attractive a form as possible and folded in greaseproof paper. He was sure that with attention to details dairying would pay on the Peninsula. Notwithstanding the hard conditions experienced last year his seven cows gave a return of £104 17/8; made up of butter, £78 12/8; milk consumed, £1 5/; and skim milk, £25 (3,000 gallons at 2d.). Against this there was £10 for 5 tons of hay, £5 for ensilage, £27 6/ for labour (3 hours daily at 6d. per hour), £13 13/ for grazing at 9d. per week each cow, and 10/ for butter paper, &c., or a total of £56 9/, leaving a net profit of £48 8/8; which he considered very encouraging under the circumstances. In regard to question of rugging cows, Mr. Correll stated that he had used rugs on his cows, and was satisfied that the practice was profitable; in fact, he believed the cost of good rugs would be more than repaid in one season.

Yankalilla, July 3.

Present—Messrs Kelly (chair), Leverington, Gardner, Stone, Crawford, and MacMillan (Hon. Sec.).

Pickling Wheat.—Mr. Leverington read an interesting paper on this subject, quoting many reports of experiments carried out by members of the Agricultural Bureau. Various solutions had to be tested from time to time, but the bluestone treatment was generally favoured. He favoured pickling on the floor, taking care to thoroughly moisten every grain. Some farmers advocated drying the pickled grain with lime, but he thought it better to pickle the seed a week or more before it was required. Care must be taken not to use too strong a solution, or the germination of the seed will be seriously affected. He considered 8 oz. bluestone to the bag of seed quite strong enough. After considerable discussion, it was resolved that the most effective method of pickling wheat was to shoot the seed into a barrel of liquor of the proper strength, skim off all the bunt balls, &c., that float, then draw off the pickle, and allow the seed to dry before sowing it.

Arthurton, July 9.

Present—Messrs. Hawke (chair), Rowe, Welch, Freeman, Lomman, Short, Crosby, Lamshed, and Palm (Hon. Sec.).

Effect of Manure on Land.—Members met at Mr. Welch's homestead, and prior to formal business, inspected the crops. Special notice was drawn to a paddock of 100 acres, which was carrying the seventh crop in as many years. Each year Mr. Welch had been applying from 150 lb. to 300 lb. per acre of phosphate, for the purpose of testing whether there was any ground for the opinion held by so many farmers that applying phosphates year after year to the same land would ruin the land for cropping. This year the crop looks very well, and Mr. Welch states that the heavy dressings have been a success, as the land is now in much better heart than it was seven years ago.

Foxes.—It was resolved to approach the local district council with a view to securing united action amongst the local authorities on the Peninsula to prevent the increase of foxes which have lately appeared in the district. It was suggested that a bonus of £1 per head should be offered for foxes.

Davenport, June 25.

Present—Messrs. Lecky (chair), Roberts, Holdsworth, McGrath, Tickle, McDonald, Hodshon, Brown, and Pybus (Hon. Sec.).

Exhibits.—Mr. McDonald tabled specimens of grubs which were damaging the gum trees in the locality, and Mr. Pybus showed model of show coop for poultry.

Spekboom.—Mr. Holdsworth referred to a new fodder plant which had been strongly recommended to him in Victoria as suitable for dry districts. The plant came from South Africa and was known as "Spekboom." [This is not a new plant, though it has not been grown here for fodder. By looking up page 495 of March issue of Journal of Agriculture members will see that they can secure roots of this plant for trial.—Ed.]

Teaching of Agriculture at Schools.—Mr. Holdsworth gave an account of the methods of instruction in public schools in Victoria, particularly with reference to manual exercises and agricultural experiments.

Sore Shoulders in Horses.—Mr. McDonald found that Row's embrocation applied to the sore with a feather, both before the collar was put on and after it was taken off, was the best cure for this trouble. Care must be taken to keep both the shoulder and the collar clean.

Plant Foods.—Mr. Pybus read extract from newspaper dealing with the various chemical elements which influence the growth of plants, and an interesting discussion ensued on the value of scientific application of fertilisers.

Maitland, July 4.

Present—Messrs. Moody (chair), Hastings, Williams, Heinrich, Treasure, Jarrett, Hill, Kelly, Tossell, and Bowey (Hon. Sec.).

Wheat Chaff.—Mr. Tossell read a paper on the "Conservation of 'Cocky' Chaff or Winnowings." He considered it a great mistake to allow this to waste in the field, as so many farmers do. Some certainly make a half-hearted attempt to save it by gathering it together in the paddock and covering it with a little straw. He advised erecting one or more rough shelters in the corners of the section, so that as many paddocks as possible were convenient to it, and labour in feeding was economised. The shed should be closed in on three sides, and staked or otherwise built up to a height of three feet on the other side. Stock can then be let to help themselves, and as the chaff is eaten from the sides it can be forked up from the middle about once a week. This chaff made very good feed in the winter for young horses and other stock, but the working horses require more nourishing feed. A shed of this description will also afford shelter for stock, and, as they all knew, this meant less food required to keep them in condition For sheep he had seen the chaff stacked inside a circular enclosure of six feet wire netting of wide mesh kept in position by a number of rough uprights. The sheep will get at the chaff through the netting, and but little attention in keeping the chaff thrown up to the sides is required. If the farmers would conserve this often despised fodder in the way suggested there would be fewer poverty-stricken animals to be seen in winter, and the carrying capacity of the farms generally would be increased. To his mind the machine to harvest the crops of the future will be a winnowing machine driven by a portable oil-engine to thresh the heads before going on to the sieves, with a dampweather apparatus on the same principle as the harvester. A machine of this sort should clean 200 to 300 bags a day, and one machine would do for several neighbours. Using a stripper and winnower of this sort the farmer could take off his crop just as quickly as with the harvester, with the advantage of saving all the chaff. The engine to drive the winnower could also be utilized for chaffcutting, corncrushing, &c. The farmer who scatters this chaff about the field with a harvester is wasting a valuable product. Members unanimously agreed with Mr. Tossell's suggestions for saving the chaff to tide over the winter months for feeding young and surplus stock, and also for providing shelter. Mr. Heinrich took exception to the harvester being described as a waster.

Millicent, July 2.

Present—Messrs. Stuckey (chair), Stewart, McRostie, Oberlander, Campbell, Hutchesson, Manuel, and Harris (Hon. Sec.).

Rail Carriage of Fertilisers.—Mr. Campbell read a paper on this subject. The carriage for fertilisers carried to Millicent (235 miles from Adelaide) was 20/8 per ton, or 17/8 per ton in five-ton parcels. In Victoria the rates were—100 miles, 2 tons, 6/4 per ton; 5 tons, 5/7 per ton; 150 miles, 8/10 per ton and 7/4 per ton respectively; 200 miles, 9/10 per ton and 8/6 per ton respectively. These rates were lower than South Australian charges, yet the Victorian Department finds the reduction in rates has led to a marked increase in the quantity of manure sent by rail. A still further reduction in the charges is advocated by The Australasian, which goes so far as to say it would pay the Department to carry manures free, as the extra return traffic would recoup them many fold. This was the practice followed in New Zealand, where apparently it is recognised that the greater the quantity of manure used the heavier the crops to be carried by the railway later on. He was convinced that if the whole of the cereal crops of the State were grown on fallowed and manured land the average would probably be nearly 15 bushels per acre, making an immense crop for the railways to carry. Mr. Campbell pointed out that in this district most of the manure used was brought round by coasting vessel at a total cost of 12/6 per ton in large parcels compared with 17/8 for railage only.

New Oats.—Mr. Campbell read laudatory notice from New Zealand papers on the value of Tartar King oats for heavy, swampy soil on which other kinds had failed. This variety was a heavy yielder with very strong straw which kept it up on rich land. It was decided to get a bag of seed for trial. Mr. Stuckey stated that Mr. Williams had twice fed down Algerian oats with sheep and then harvested a crop of grain on land which Mr. Stewart said he did not think would grow a crop.

Potatoes.—The Chairman stated that on the Mount McIntyre Flats seven acres of Redskin potatoes had yielded at the rate of 19 tons per acre. In reply to question several members stated that they had no trouble with cut setts of Early Rose. Mr. McRostie said he planted several acres with cut Redskins and got a splendid stand, though many growers held that this variety would not stand cutting. Mr. Stewart reported that at Rendlesham 2 cwt. of Professor Maercker potato had been planted and two tons dug from the crop. At previous meeting Mr. Campbell read a paper on a remedy for the glut and consequent low prices received this year for their potatoes. Although they had dug heavy crops, the prices received would, in some parts of the south-east, barely pay the cost of digging and carting to the station, and large quantities in the Glencoe district would probably be left in the ground to rot unless prices improved. It was practically out of the question to utilise any large quantities in the feeding of pigs owing to the labour involved, as the potatoes would require to be steamed or boiled; to feed them to cattle all the larger ones would require slicing. He thought however it was possible to utilize them in the manufacture of starch. Ten years ago in Maine, U.S.A., potato starch factories were established, and as much as 5,000 tons of starch produced in a single year. This represented 20,000 to 25,000 tons of potatoes, and the price paid at the factory was about £2 2/ per ton without the bags. At this price, within eight or 10 miles of their farms, he was sure that growers in the south-east this year would have been in clover. What became of the starch he did not know, though he thought it possible it finds its way to the consumer as sago. The process of manufacturing the starch is a very simple one and the plant very inexpensive. A good supply of water is required to get the starch from the disintegrated potatoes. There are no by-products from the factory. The pomace, or refuse potato pulp, is of no use or value, except it might be for putting on land close by the factory, but in America it is allowed to flow down the stream. It would be necessary to ascertain what prospects there were of a sale for the starch when made and the possibility of turning it into "sago," or getting some one else to do so. If the evidence is satisfactory, the suggestion is that a factory be built (preferably by co-operative effort) on one of the swift-running drains of the district—the Tantanoola or Snuggery drains would answer admirably. Both are close to a railway station or siding, firewood would be plentiful and cheap, and timber for building close at hand. The refuse would not be objectionable in the drains, as at the time of year when operations would be carried on there would be a good stream running which would carry it away.

Loss of Ducks.—The Hon. Secretary reported loss of several ducks through their eating bran and coarse salt. Several members had known pigs to be killed by brine and salt meat.

Officers.—Messrs. A. McKostie and J. Davidson were elected Chairman and Hon. Secretary respectively.

Port Germein, July 4.

Present.—Messrs. Stone (chair), Blesing, Kingcome, Hillam, Head, Thomas, Holman, Harvey, and Gluyas (Hon. Sec.).

Seeding Operations.—Mr. Hillam read a paper on the best way to sow wheat, and was it profitable to use manure in their dry areas? Most of the old farmers had seen many changes in the method of sowing wheat—first, the old method of distributing the grain by hand; later on they saw the seed scattered from the back of a springdray, by which means 40 to 60 acres per day were sown. Of the mechanical seedsowers, the broadcast machine which sowed up to 60 to 80 acres a day came first, and in the northern areas this for many years was the cheapest and best method of seeding. The cultivator with seedbox attachment and finally the seed drill were introduced. The question for them to consider was which of the three mechanical appliances was best; as the value of manure in their dry district had not been satisfactorily demonstrated the seed drill must be considered apart altogether from the manure question. The main point in favour of the broadcast sower was the cheap way in which large areas can be sown in a short space of time; the question of time alone being of great importance to the farmer sowing several hundred acres. The difficulty of getting suitable weather for using the broadcast sower was a drawback; the wind is generally from north or south for the greater part of the day, resulting when sowing east and west in alternate strips of thick and thin sowings. Another objection is that the seed is buried at irregular depths; some is covered four inches or five inches, and unless they got very good rains does not germinate, other seed is barely covered, and if a dry spell occurs before the plants take good root, they will die off. With regard to the cultivator with seed attachment, on fairly-worked land a man with a single team can put in his crop with far less labour than with the seed drill, and it has the same advantage that the seed is properly covered and the ants do not carry it away. The drill was unquestionably the most expensive way of putting in the seed. There was the cost of the drill, increase in labour, horsefeed, and horseflesh, and the slow rate of seeding to be considered. About 15 acres a day was fair work with one team of three staunch horses well looked after. With two teams it was, he believed, possible to put in 25 to 30 acres daily, but more labour was required in changing and attending to the extra horses. Were the advantages more than sufficient to balance these drawbacks? First there was the regular depth at which the seed is sown; then there was the saving of seed, as under the broadcast system a certain proportion always failed, for the reasons previously stated. Another thing in its favour was that the drill deposited the seed on a better and firmer seedbed, giving it a chance to germinate straight away if the ground is sufficiently moist. His experience was that after rain they could safely continue sowing with the drill a week after they could with the broadcast sower, and also that the plant would come up better, in the heavier soils especially; a good start was often half the battle. Taken altogether, he believed it would pay them to put a portion of the crop in with the drill, whether they used manure or not; at the same time they would do well to continue to use the broadcast sower under favourable conditions. Now came the question—Does it pay to use commercial manures here? They had had very little experience yet, as the last few years have been exceptionally dry. Three years ago he used 30 cwt. of manure, putting on 50 lb. per acre, but could see no benefit. The next year he used 4 tons in all, but again he experienced no success, a lot of the wheat failing to come up. He attributed this mainly to the dry seeding and partly to his ignorance of when to stop using the manure. In common with a number of other farmers he has found that it does not do to continue putting in the seed with the manure when the land is only half-moist; that is, not dry, but not moist enough to cause the wheat to germinate properly. Apparently when the soil was a little too dry for the grain to germinate at once the manure will assist in causing the grain to malt. His opinion was that they should sow when the land is quite dry, or wait until it is wet enough to ensure quick germination, the latter preferable. To be profitable, the manure must increase the crop to the extent of two bushels per acre, and if they could be sure of getting 10 in. to 12 in. of rain he believed they would get an increase of four bushels or more per acre; but what they had to consider was whether the profits they got in such seasons would more than balance the failures when only 6 in. to 8 in of rain fell during the year At Booleroo in 1901-2 the manure was a marked success, last year in most cases its use resulted in direct loss. With a return of fair seasons he believed it would pay to put in at least half their crop with manure and when the season opens favourably even a greater proportion.

Penola, July 11.

Present—Messrs Darwent (chair), Ockley, McKay, Miller, Ricketts, Morris, Worthington, Stoney, Maxwell, and Allnutt (Hon Sec)

Small Holdings.—Mr. Darwent read a paper on the advantages of small holdings By small holdings he did not only mean small blocks suitable for intense culture, but holdings on which a man can earn his living, varying according to quality of soil and the use to which it can be put. In the south-east much of the land was suitable for mixed farming, for which holdings of 150 acres to 200 acres were required. Root crops should be grown and better classes of grasses established, by which the carrying capacity of the farm will be doubled. On an improved block of this description 500 sheep, or large cattle to correspond, could be carried Grain crops in rotation with roots, &c., could be grown, especially if dairying is practised Poultry and pigs should also receive attention Then again there were thousands of acres of land eminently suited to the growth of fruit trees and vines which were now producing nothing but worthless timber To settle a producing population on this land would be of great benefit to the district Then, finally, there were smaller blocks of the best soil for working men's blocks on which their families could be brought up and taught to be useful men and women, and fitted to earn their own living later on. Those who have to do with men on station properties know that the men's huts are not of such character as to be comfortable to the boys, who get away to the townships as soon as they can, nor do they afford any opportunity of teaching the lads habits of thrift or industry. It would be to the advantage of the whole State if the men had small blocks of land on which they could make homes for their families and grow produce to reduce their expenses

Agricultural College for the South-East.—After discussion it was resolved that it would be of great benefit to the south-east to have an Agricultural College in the district.

Colton, July 4

Present—Messrs Kenny (chair), Riggs, Inkster, Kleeman, and Packer (Hon. Sec.).

Manures for Wheat Crops.—Discussion on this subject took place, and it was agreed that more attention would have to be paid to this question on the West Coast if they were to grow wheat successfully Mr. Kleeman had best returns on his plots at the public school with Wallaroo super, while Mr. Riggs found Thomas phosphate suited his land best, and its effect on the growth of grass after the crop was very noticeable.

Booleroo Centre, July 7.

Present—Messrs. W. Clack (chair), Nottle, Arthur, Michael, Murdock, Sargent, J. Clack, Brooks, Repper, Dr. Steven, Albinus, McMartin (Hon. Sec.), and four visitors.

Malting of Wheat.—Dr. Steven tabled some grains of wheat which were sown when the land was wet, but which failed to grow. The grains were quite mouldy, and members generally were of opinion that the failure was due to the surface getting too hard to enable the young plant to get through, resulting in the grain going mouldy.

Fruitgrowing.—Mr. Albinus read a short paper on this subject. His experience in this district was that cherry trees fail to stand the dry weather and suffer from the attacks of white ants. Apricots and peaches do well for a few years, but the ants attack them in dry years. Plums also do not live long. Almonds are very hardy and stand well in this locality. Peaches on almond stocks are not so hardy as almonds. Pears, apples, and quinces do very well. Last year they bore very good crops, notwithstanding the dryness of the season. Figs also thrive; in fact, figs and quinces appear to stand greater hardships than any other fruits. Planted in lowlying ground they bear well and require but little attention. Grapes grow well in this locality, Muscatels being about the best for general use, as when they carry good crops the surplus can easily be converted into raisins. When he first came to the district he was told that only stone fruits should be planted, as other varieties would not stand the severe seasons. His experience had, however, been the reverse. The Chairman stated that, with the exception of one peach tree, the stem of which he painted with tar, the white ants had destroyed all the trees he had planted. Mr. Murdock said he had never been troubled with white ants in his trees. The main drawback to planting was that the trees they bought were reared in rich soils, and the change to the poorer land checked their vigour. He would prefer trees grown on poor soils. It was a mistake to think that in this locality quinces must be planted near the watercourses. He did not favour the peach on either apricot or almond roots. Messrs. Brooks and Nottle believed it paid best to leave gardening alone in this locality—the produce generally cost more than it could be purchased for elsewhere.

Field Trial and Show.—It was decided to hold a field trial of implements and show of products, &c., on August 5.

Appila-Yarrowie, July 3.

Present—Messrs. Keller (chair), Bottrall, Francis, Lawson, Fox, Wilsden, Stacey, Catford, Daly, Canning, Grant, Klemm, Becker, and Bauer (Hon. Sec.).

Annual Report.—Seven meetings held, with an average attendance of nearly 11 members. A fair number of visitors has attended meetings, two papers have been read, a homestead meeting was held at Mr. Bottrall's residence, a visit by Prof. Towar arranged, and generally their meetings had been of a profitable character. During the year Mr. C. W. H. Hirsch, one of the founders of the branch and one of their most energetic members, had died. Messrs. J. C. W. Keller, G. W. Francis, and C. G. F. Bauer were elected Chairman, Vice-Chairman, and Hon. Secretary respectively.

Judging of Horses.—Paper by Mr. Shepherd in April issue of Journal of Agriculture on "Judging Horses" was discussed. Members agreed that judging was a difficult task, and that tape and notebook were almost necessary to efficient judging. Some of the members agreed with Mr. Shepherd that the feet were too often unexamined by the judge; they were also of opinion that the too forcing food given to stallions when young tended to develop softness in the feet.

Ensilage.—In reply to enquiry, Mr. Bottrall said he had cut crops for ensilage just before the hay crop was fit to cut; one year it turned out first class, but the next year it was too dry.

Longwood (Mylor), July 4.

Present—Messrs. W. Nicholls (chair), J. Nicholls, Oinn, Bradley, Smith, Narraway, Mundy, Hughes (Hon. Sec.), and 12 visitors.

Ensilage.—Mr. Narraway read a short paper on this subject. Last November he cut some oats when they were turning yellow and carted at once to the pit. A layer of about 18 inches was put in, and when the temperature rose to 120 degrees F. more was added, and so on until the pit was filled, when it was left until the temperature reached 135 degrees. He then covered it with earth for weight and left it until the middle of June. The pit was 8 feet x 6 feet x 5 feet, excavated in good clay, and the covering was also clay. Although the latter was saturated with soakage water, the silage was in fair order. At first the cow sniffed at it and left it, now she will help herself from the pit, which, unfortunately, had got flooded and the silage was floating on the top. Mr. Narraway tabled sample of the ensilage, and also read extracts from various papers in The Journal of Agriculture dealing with the same subject. Mr. Bradley stated that while ensilage and oats together were not of much value for working horses, if mixed with chaff it made capital feed. The Hon. Secretary thought they required hay rather than ensilage in this cold district. They can grow green feed all the year round, so there was little necessity for making ensilage. Members generally thought that ensilage being made from green crops cut in their prime was preferable to immature green feed, or feed cut after it was past its prime.

Potatoes.—Mr. Oinn tabled Snowflake potatoes weighing up to 2 lb. 6 oz., which, he stated, were sound, cooked well, sell readily; it was one of the best to grow on their swamp lands. On irrigated sandy soil, manured with three barrow loads of manure to the rod and a little commercial fertiliser in the drill, he dug nearly two bags of potatoes to the rod. To a kerosine tin full of bonedust he added 4 lb. of sulphate of ammonia and 4 lb. of muriate of potash. Mr. Bradley spoke favourably of Hero potato. From 28 lb. sound seed planted on 7 rods of land he dug 14½ cwt. Mr. Oinn also spoke well of this variety, and the "Jewel" was referred to as a good variety for the higher ground.

Binding Banks of Creeks.—Mr. Oinn called attention to report from Forest Range on this subject (page 643, Journal of Agriculture for May, 1903). Members find Yorkshire fog grass preferable to either couch grass or buffalo grass, as it serves the purpose and does not spread like the two latter grasses. It is also more easily eradicated should it spread on to garden land.

Tatiara, July 4.

Present—Messrs. Fisher (chair), Killmier, Smith, Reschke, Wiese, and Hughes (Hon. Sec.).

Breeding Horses.—Mr. Killmier read a short paper on this subject. The first step toward the improvement of their horse stock was to get both mare and stallion into good condition for breeding. If the mare is a dry one and has been working hard she should be fed well and got into good condition, but not too fat. They should always have a paddock of feed for the mares, and also give them feed in the stable so long as they will eat it. During the cold spells they should be stabled at night. A good warm mash of bran and crushed oats on cold mornings will go a long way to keeping the blood circulating, and will improve the condition of the animals. This treatment will also assist them in shedding their coats quickly. When she comes in season the mare should be put to the horse as soon as possible, and after being served let her remain quiet in the stable for two or three hours, then turn her out with other mares. After the first service let nine days elapse before trying her, but on no account let the stallion worry her if she shows no sign of being in season. He believed many failures were due to the mare being worried in this way; in fact he had heard experienced breeders in Scotland insist that three weeks should be allowed to elapse after the first service before allowing the horse with the mare again.

Quorn, July 11.

Present—Messrs Thompson (chair), Rowe, Smith, Patten, Brewster, Cook, Toll, and Noll (Hon. Sec.).

Professor Towar.—Exception was taken to the tone of the press reports of recent visit of Professor Towar to Quorn, as the lecture was greatly appreciated and was very instructive.

Frost.—In reply to question members generally were of opinion that as far as wheat crops were concerned frosts were beneficial, as they checked too rapid growth and caused greater root development. Frosts also destroyed many injurious insects.

Hay.—Mr. Smith's experience was that the best time to cut wheat for hay was when the grain was three parts formed. Members agreed, and also thought owing to the scorching winds experienced in the north it was necessary to cut the crop greener than in the south, as it rapidly got too ripe and deteriorated in value. Members advised stooking the sheaves immediately after cutting, to secure a nice green colour in the hay. Much, of course, depended upon the weather at time of cutting.

Fallowing.—Mr. Rowe said the time to fallow must vary with the season. He liked to have the oats and other weeds well up before he started ploughing Not only did this save a lot of trouble afterwards in keeping the fallow clean, but green stuff turned under improved the soil. Where the soil was shallow deep ploughing was a mistake. It would be better to plough shallow and subsoil afterwards

Cradock, July 4.

Present Messrs Ruddock (chair), Turner, Paterson, Marsh, Garnet, Symons, Iredell, Haggerty, Graham, Solly, Lindo (Hon. Sec.), and four visitors.

Poison Weeds - Mr. Solly tabled several specimens of alleged poisonous weeds, and stated that a number of horses and sheep had died after eating them The horses appear to be quite dazed, and may lie down for hours at a time, and suffer for two or three days. If driven quickly for a short time they are attacked by violent shivering, but soon recover. The affected sheep appear to suffer from paralysis, especially of the hindquarters; the body swells as if blown up with wind, while a watery fluid escapes from the nostrils. Death takes place in from 10 to 48 hours. Sheep from saltbush country did not seem affected, but those from the south suffered severely. The Hon. Secretary stated he found these plants very good feed for stock, but care was necessary that they did not eat too much when turned into the paddock at first or when very hungry. He believed an ounce of carbonate of soda in a pint of water given to affected animals would cure them. A pint of the solution was sufficient for six sheep or one large beast. [Two of the plants are species of Euphorbia, one is Lotus sp. and the other Zygophyllum sp. All of these plants will cause bloat, or acute inflammation, if strange or hungry stock partake freely of them. See report Mundoora Branch, page 703, June issue of Journal of Agriculture. Ed.]

Vegetable Growing.—Mr. Paterson tabled specimens of vegetable marrow, and stated he found it best to soak the ground round the plants in preference to sprinkling the water on the foliage. Mr. Symons considered the latter method best, as it tends to keep the plants free from insects and the soil does not bake so much as it does after flooding. In growing vegetables the ground must be kept moist and the hoe used to prevent the surface from setting.

Germination of Seeds.—The Hon. Secretary stated that his land, which had been bare of vegetation for so long, had been producing a fair crop of "squash weed," which, although poor feed, led him to hope that the land would stop drifting and become covered again with better feed. Some discussion ensued on the germination of seeds, and the length of time that certain classes of seeds have remained in the soil and then germinated when favourable conditions ensued was commented on.

Mallala, June 1.

Present—Messrs. Warden (chair), Marshman, W. and S. Temby, A. and H. B. Moody, Loller, Wilson, Churches, Nevin, McCabe, Stephenson (Hon. Sec.), and two visitors.

Poultry.—The Chairman read a short paper on this subject. Whatever the poultry industry might mean from the point of view of the fancier or the man that had to purchase all the food they require, there was no question that to the farmer it was a financial help that he could not well do without. It is true a good deal of hay may be wasted, but on the other hand there were bushels of grain about the haystack and on other parts of the farm which the fowls turned to profit, but which would otherwise be wasted. Where rabbits are numerous and parties went out shooting it was advisable to keep the bodies of the rodents shot to cook up for the fowls. Mr. Warden advocated the use of portable houses for poultry so that the fowls could be moved from place to place on the stubbles to pick up any grain left on the ground. He favoured hatching eggs by means of the incubator, one great advantage of which was that a large number of birds can be hatched out at the one time. It was, however, not advisable to use the incubator during very cold or very hot weather. Although he favoured hatching by artificial means, he would, if possible, give the chicks to hens to rear. To get the greatest profit the chicks should be raised as early in the season as possible, in order that any birds not required for laying or breeding purposes would be ready for market by October or November. One member thought that too much had been made of the poultry industry, and that the same amount of energy expended in other directions would have returned greater profits. Generally, however, members agreed with Mr. Warden on the question of the profit from poultry.

Nantawarra, July 8.

Present—Messrs. Dixon (chair), J. and R. Nicholls, Belling, E. J. and A. F. Herbert, W. J. and J. W. Dall, Greenshields, Spencer (Hon. Sec.), and two visitors.

Argentine Wheat.—Mr. W. J. Dall reported that out of 28 grains of Argentine wheat sown 27 germinated in about a fortnight. He thought the germination rather slow, which, however, was attributed by other members to the cold. Mr. Nicholls had also sown some of this wheat as an experiment, and found the germination satisfactory.

Fertilisers for Fruit Trees.—In reply to question members thought if super or other fertiliser was broadcasted and worked into the soil around fruit trees it would be beneficial to the trees. Having little experience on the subject, they would like to have information from fruitgrowing districts on method of application and manure to apply.

Poultry Complaint.—Mr. Greenshields reported complaint among his fowls. Their heads were swollen and a cheesy matter formed about the mouth and eyes. Members thought the disease was roup, and read treatment recommended by Mr. D. F. Laurie in his Poultry Manual. Some members advised killing affected birds and burning the bodies. [Disease is undoubtedly roup, and is easily cured if taken in time. Carefully clean away the cheesy matter and bathe the eyes and head with strong solution of boracic acid in water.—Ed.]

Vegetable Growing.—Considerable discussion on the growing of vegetables took place. It was stated that gardens that formerly gave excellent result will not now produce decent crops of vegetables, although the soil was well worked and manured. Members would like to know why this should be, the complaint being common in this locality. Mr. Uppill reported having for several years grown good turnips on patches of light soil in the fallowed paddocks; he mixed the seed with some superphosphate, and then broadcasted it on the land. Two of the members reported having sown small quantities of turnip seed with the wheat by means of the seed drill. The young wheat sheltered the turnips at the start, and from seed sown in April they were now getting turnips fit for the table.

Wilmington, July 8.

Present—Messrs. Lauterbach (chair), Hannagan, Noll, Maslin, Sullivan, Broadbent, Zimmermann, Payne (Hon. Sec.), and four visitors.

Rugging Cows.—Discussion on this subject took place, the members generally being in favour of rugging during the cold winter months.

Fruitgrowing.—The Hon. Secretary initiated a discussion on the utilization of the rich gullies and table lands of the Flinders Range for the growth of fruit. There was much land that was well adapted to the growth of apples, currants, raisin grapes, citrus fruits, potatoes, &c. The only drawback was that it would be somewhat difficult to get the produce out of the rough country, though pack horses could be utilized for the purpose. Most of the members agreed that any one anxious to secure land for fruitgrowing might do worse than take up some of the rich hill country in this neighbourhood.

The Vine Industry.—Mr. Sullivan read a short paper to initiate discussion on paper read at Congress by Professor Perkins on the Vine Industry of South Australia. The figures given showed that our wine industry was making good progress, and gave considerable employment to wage earners He trusted that the expectations of Professor Perkins of the ultimate development of the industry would be fully realized, as the whole State would undoubtedly benefit considerably thereby. Mr. Sullivan gave an interesting account of a visit to Seppeltsfield. He thought South Australian winemakers were to be congratulated on their energy and enterprise and on the quality of the wine produced here During the past year the whole of the papers read at the Annual Congress have been discussed at meetings of this branch, members taking it in turn to write short criticisms on each, and much benefit has been gained from the adoption of this practice.

Mount Bryan East, July 4.

Present—Messrs. Durstan (chair), Bryce, Dare, T. and E. S. Wilks (Hon. Sec.), and one visitor.

Tailing Lambs Discussion on this subject ensued. Most of the members favoured tailing at from four to six weeks old, as they considered the operation did not check the lambs so much as it would if performed later.

Hartley, July 10.

Present—Messrs. W. Brook (chair), C. Brook, Jaensch, Reimers, Stanton Klenke, Kutzer, Hassam, Wundersitz (Hon. Sec.), and nine visitors.

Annual Report.—Eight meetings held, with an average attendance of eight members. Two members have been struck off the roll for non-attendance.

Milktesting.—Members were agreed that a Babcock milktester was necessary on the farm in order to find out which cows were profitable to the owner.

Ropemaking.—Mr. Wundersitz gave an exhibition of ropemaking from waste binder twine, using home-made apparatus for the purpose. Members were very favourably impressed with the serviceable ropes turned out from what is usually wasted, and a hearty vote of thanks was accorded to Mr. Wundersitz for showing how the work was done.

Holder, July 11.

Present—Messrs. Rowe (chair), Vaughan, Blizard, Perry, Jones, Tuck, Starr, Rodgers, Stuart, Green (Hon. Sec.), and three visitors.

Pruning.—Meeting was held at Ramco Settlement, and most of the time spent in inspection of the different gardens. Demonstrations in the pruning of apricot trees were given by Mr. Vaughan, and an interesting paper by Mr. Paul, of Mildura, on the Muscat Gordo Blanca raisin vines discussed.

Rhine Villa, July 10.

Present—Messrs. G. A. Payne (chair), Farey, F. F. Payne, Schick, Start, W. T. Vigar, H. W. Payne, Hecker, Pannach, and J. W. Vigar (Hon. Sec.).

Fallowing.—Mr. J. W. Vigar read a short paper on this subject. He strongly advocated early fallowing in this district, starting directly seeding is finished, as the soil then works better, and the horses have to be fed, whether worked or not. With early fallow it was possible to clean the land better, and also to conserve moisture. Surface cultivation during the spring and summer was necessary to check evaporation and to permit the circulation of the air through the soil. The effect of aeration on the fertilising constituents of the soils was of great importance. Cultivation also tends to keep the soil cooler, and thus makes it possible for the germs in the soil to carry out to best advantage their useful work. Some farmers say that land on which the crop has proved a failure will be as good as fallow land next year, but this was not correct. He knew of one paddock that had failed for five years in succession, yet the growth this year is inferior to that on newly ploughed grass land. He believed that the five failures took more out of the ground than five average crops would have done, for the reason that the surface was bare all the time, and never cultivated from one seedtime to the next. Stiff land especially should be fallowed, because it was seldom they got rain early enough to plough it properly in time for seeding. Stony land should be fallowed, as without the after cultivation it was impossible to kill the grass and weeds on it, as the stones prevent the furrows turning over properly and burying the weeds, &c. Mr. Pannach agreed that all stiff land should be fallowed, but considered it useless to fallow sand. The Chairman would plough light land north and south, and drill in the same direction, as he found the prevailing strong westerly winds did not have the same scope for sweeping between the rows.

Woodside, July 6.

Present—Messrs. Caldwell (chair), Rollbusch, Lauterbach, Keddie, Fowler, Kleinschmidt, Johnson, Pfeifter, Hutchens, and A. Hughes (Hon. Sec.).

Standard Weight for Chaff.—Members supported proposal for adoption of a standard weight for the bag of chaff, and favoured a standard of 42 lb. gross weight.

Root Crops.—Mr. Keddie read a paper on growing root crops and their value for cows. He showed some very fine specimens of both red and white carrots, which, he stated, his cow was very partial to, and which not only produced a good flow of milk, but also kept her in good condition.

Mount Gambier, July 11.

Present—Messrs. Mitchell (chair), Edwards, Williams, Watson, Pick, Wedd, Dyke, Wilson, Barrows, and Lewis (Hon. Sec.).

Pickling Seed Grain.—Discussion on this subject was continued. Method of pickling in a cask was described, and experiences under varying conditions were mentioned.

Officers.—Messrs. J. Dyke, T. Edwards, and E. Lewis were appointed Chairman, Vice-Chairman, and Hon. Secretary respectively. On behalf of the members, Mr. Watson presented to Mr. Lewis a silverplated inkstand and a hot-water kettle, in recognition of his many years' services as Hon. Secretary of the branch. Mr. Wilson was thanked for the use of meeting room.

Swine Fever.—Mr. Williams referred to outbreaks of swine fever in Victoria and New South Wales, and urged pigowners to promptly report to the Stock Inspector any cases of sickness in their pigs, as there had been importations from Victoria some few months ago.

Kingston, July 4.

Present—Messrs. Pinches (chair), Goode, Barnett, McBain, Cooper, Clark, McCulloch, Fraser, and Wight (Hon. Sec.).

Foxes—Discussion on this subject took place, and the necessity for drastic action to cope with the pest was admitted. It was decided to support the action of the local council in offering payment for all foxskins brought to the district office.

Ramie—Mr. McCulloch read extract from Victorian paper on the possibility of the profitable cultivation of this fibre plant in Australia.

Drainage Areas.—Mr. Goode reported on visit to Millicent drainage areas, and spoke of the crops grown and stock fattened on the drained land, which formerly were of little value. The question of utilising potatoes, when prices are low, for feeding stock was referred to. Some members could not get their horses to touch potatoes. Mr Goode advocated the draining of the swampy lands in the Kingston district, and contended that if this were done the work would prove just as profitable as operations around Millicent. Mr. Barnett agreed that it would be a simple matter to drain off the water through Reedy Creek to the sea.

Mount Pleasant, July 10.

Present—Messrs. Phillis (chair), Miller, Drogemuller, Maxwell, Tapscott, and Vigar (Hon. Sec.).

Farming on 80 Acres—Paper in June issue of Journal of Agriculture, by Mr W. Jamieson, of Gumeracha on making a living off 80 acres of land, was read and discussed Members were of opinion that in this district they could not make such a living off an 80-acre section as pictured by Mr. Jamieson.

Large v. Small Grain for Seed—This subject was well discussed. Members favour large, plump grain for seed purposes

Onetree Hill, July 10.

Present Messrs I Bowman (chair) G and F Bowman, Blackham, Ifould, Smith, Thomas, and Clucas (Hon. Sec)

Farming on 80 Acres Paper read at Gumeracha by Mr. W. Jamieson on "How to Make a Living off 80 Acres of Land" was discussed Members generally were of opinion that Mr Jamieson was too sanguine as to the results, especially in respect to the revenue from pigs, also that the cost for labour had been underestimated.

Growing of Fodder Crops—Mr F L Ifould read a paper on this subject The growing of fodder crops was not general on farms; in many cases not even a small plot of barley was grown for green feed He was, however, convinced that the time was not far distant when the practice of growing some fodder for early feed, especially for dairy cows, would become more general A ton of green stuff in June or July is of greater value to the stock owner than a good many tons later on in the season Dairymen would be able to bring some of their cows in earlier and thus secure the benefit of the higher prices ruling for their produce, besides being able to extend the milking season. Wherever it was possible to keep up the supply of green stuff into the summer, summer fodder crops should be grown. The shortness of the grass season throughout the greater part of the State was a serious drawback to the graziers' industry in all its branches. When they had to depend entirely on the natural herbage there was far too much lost and unproductive time with the dairy herd, and a period when all stock suffer for want of some succulent food. The growing of green crops to tide over this period will make all the difference between profit and loss on the year's work. He could speak from his own experience on the possibility of growing this fodder. On most farms a small area of land suitable to the purpose and convenient to the homestead can be found. This should be fallowed early, and a heavy dressing of farmyard manure applied. Where there is not sufficient of this manure give a liberal dressing of commercial fertilisers, as it is imperative that these crops be forced on early, or their main advantage will be lost. Various cereals will be found suitable—Cape barley, rye, and some of the earlier maturing wheats, of which Bartlett's Crossbred should be mentioned. When only a few stock are to be fed it is best to mow the crop and carry it to them. For feeding on a larger scale this entails too much labour, and the best plan is to have several small paddocks and graze them. Turn the stock in for a short time each day, but not when the ground is wet and boggy. As soon as the crop in one paddock is eaten down sufficiently put the stock on to the next. If heavily manured, the crop will quickly grow again, when it can be treated as before. In addition to these cereals, mustard and rye are finding favour with many farmers, and those who have tried them report well. For milk cows and sheep he knew of nothing better than rape. It is good for milk production and for fattening. Pigs are also very partial to it, and for lambing ewes it is first class. Mustard will come on earlier and is a good fodder, but imparts a bad flavour to milk. The slight taint imparted by rape almost disappears when the milk is put through the separator. He noticed a member of Port Broughton branch had grown rape, but could not get his cows to touch it; probably this was due to the fact that it was new to them. He had no difficulty in this direction with his cows, nor had he experienced any serious results from turning the stock into the rape paddock. His practice was to put the cows in for a short time each day. To grow rape or mustard the land should be fallowed and worked down as fine as possible. From 2½ lb. to 3 lb. of seed per acre will be sufficient, and should be drilled in fairly deep. Sow after first rains in order to give it a good start before the weather gets too cold. Last year he fed off a paddock of rape from July to the end of November, and then it was springing again after the rain. Mustard does not last, dying out after twice feeding down. When rape begins to run up to seed, usually about the end of September, feed it down fairly hard. He was convinced that if farmers would only grow rape they would be surprised at the quantity of fodder a small paddock will produce. From his five-acre plot he got as much feed as from any 50 acres of grass land on his farm. Of course where lucerne can be grown successfully there is no necessity to look further; but it is only in relatively favoured locality this can be done. For summer fodders maize and sorghum can be grown in the hilly districts with a fair degree of success. Rich moist land, fallowed early, will give the best results. Seed should be sown about the beginning of September, to give the plant a good start before the dry weather sets in. Maize was preferable for milking cows, as it comes up quicker and more evenly than sorghum, is more sweet and succulent, and much appreciated by cattle. It will not, however, stand dry spells like sorghum, and the latter will grow where maize will fail. About 1½ bushels per acre of maize, or 5 lb to 7 lb. of sorghum, amber cane, or holcus, will be required. A good crop of wheat can be grown on the fallow after either maize or sorghum, though, perhaps, not quite so good as on bare fallow. Any maize or sorghum not required for green feed can be converted into ensilage, and should be chaffed into the pit. Both were more suitable for horses and cattle than for sheep, as the latter only eat the leaves. As maize matures earlier than sorghum a succession of crops can be secured by sowing seed of both about the same time; a second cut of sorghum will probably be obtained, but the maize rarely shoots again after cutting.

Murray Bridge, July 10.

Present—Messrs. Edwards (chair), Jaensch, H. and W. Schubert, Stecker, and Lehmann (Hon. Sec.).

Agricultural Motors.—Discussion on this subject took place. Members were of opinion that motors for farm work will largely supply horsepower on many farms in the future, but did not think they would prove suitable for work on sandy country, especially on the sandhills, which in many districts are now cultivated.

Horse-breeding.—Mr. W. Schubert read a paper on "Horse-breeding on Small Farms."

Wepowie, July 6.

Present—Messrs. Gray (chair), T. and R. Yates, Orrock, Chrystall, Smith, Hanna, and four visitors.

Early Fallow.—The Chairman read a paper on this subject. In fallowing the time of ploughing and the condition of the land when ploughed have most important effects on the result of the work. They fallowed their land (1) to clean it; (2) to permit the rain to enter freely to the subsoil; (3) to promote the circulation of air and moisture in the soil so as to secure to the fullest extent the physical and chemical and biological changes brought about by their action; (4) to conserve for the following crop as much as possible of the moisture that enters the soil. The earlier in the season that the ploughing is done the more marked will be the results in each direction. With late fallowing there is less opportunity for weed seeds to germinate, and less chance of cleaning the land, as practically only the weeds that germinate before ploughing are destroyed. With early fallowing two or three successive crops of weeds can be disposed of. The winter feed secured from the land when fallowing is delayed is not worth half a bushel of wheat per acre, but judicious early fallowing will increase the yield by several bushels. The land late fallowed does not through the summer become sufficiently mellow and consolidated to be in the best state for the sowing of the cereal crops in autumn. If the land is lifted early much of the winter rain water gets down into the subsoil instead of flowing off from the surface, and carrying off with it much valuable fertilising material Contrast with this late fallowing. The warm weather is here before it is finished; the plough turns up a moist surface for evaporation, and the drying air plays practically to the bottom of the furrow, unless the land is cultivated and harrowed right away; the microscopic germs are in conditions unfavourable to activity, and less nitrogen is stored up in the land. Altogether the late fallower reaps the result of his delay, in a sickly, pale-coloured, dirty, and poor crop. Early fallowing will not, however, always ensure a clean crop, last year's fallowing being a case in point, and crops this year are dirty. The last advantage in the list enumerated in favour of fallowing is, for much of their district, the most important. The rainfall is barely sufficient for a good crop, and thorough fallowing is, he believed, a means of conserving moisture sufficient to equal an increase of from 2 in. to 3 in. of rain in the succeeding season It is this fact that has led the great majority of their best farmers to consider thorough fallowing the key to success in cereal growing; and cereal growing is the all-important part of their cropping. Most men who take time by the forelock will be busy fallowing. Many this year are delaying on account of horsefeed being so dear, but he thought it will well repay those who can do so to buy, even at the present high price. Fallow should be from 4 to 5 in. deep, according to nature of the soil, then harrow it well down, and work it later with a spring cultivator or some other suitable implement. By doing this the soil would not be so hard at seed time, and would be in a better state for drilling. Considerable discussion ensued, most of the members agreeing with Mr. Gray.

Riverton, July 11.

Present—Messrs. Hussey (chair, and Hon. Sec.), Hannaford, H. A. Davis, W. B. Davis, A. J. Davis, Gravestock, Badman, Calf, Gray, Dr. Glynn, and three visitors.

Annual Report.—Ten meetings held, with average attendance of nearly eight members. Good work had, on the whole, been done, four papers being read and discussed. The Hon. Secretary was accorded a special vote of thanks for his 10 years' service in that position; was re-elected for ensuing year. Messrs. A. J. Davis and W. Hannaford were elected Chairman and Vice-Chairman respectively.

Feeding off Crops.—In reply to query in July Journal of Agriculture for reason for considering it advisable to only feed off the crops on fallow land, members said the growth on land cropped for two years in succession was not so strong as on fallow land; consequently it was not advisable to run sheep on the crop.

Lipson, July 4.

Present— Messrs. Potter (chair), Swaffer, Wishart, Brougham, Brown, Charles and Caleb Provis, Baillie, Carr, Bratten, Barraud (Hon. Sec.), and two visitors.

Market for Fat Lambs.—Discussion was continued on prospects of doing anything in this district in the lamb trade. One of the members held that it was waste of time to talk over the matter owing to absence of facilities for getting the lambs to Adelaide in good condition, but the majority thought this difficulty could be overcome, and several expressed their intention of making a trial shipment next season.

Stinkwort.—Mr. Charles Provis read from Journal of Agriculture paragraph in reference to injury to sheep caused by stinkwort. One member said sheep would fatten on young stinkwort, but the other members were decidedly sceptical of this.

Disc v Hoe Drills.—Mr. Charles Provis read a paper on this subject. After three years' experience with the hoe drills, and one with the disc drill, he was strongly impressed with the advantages of the disc drill. Where the hoe drill will make good work the disc drill is equally efficient. Where there are any straw, tussocks, stones, stumps, &c., the disc drill will work without any trouble, but the hoe drill does not do satisfactory work where there is any rubbish of this description. Any lad who can drive can use the disc drill in any class of land, and it can also be worked on land too wet for use of the hoe drill. The former drill also leaves a small drill mark, which means less exposure of the soil to drying influences, and in hilly country less chance of heavy rain causing runs along the track of the drill. More work can be done in a day with the disc drill, and in cloddy ground it will break more lumps than the hoe drill. There was no risk of the discs breaking on the stones, and altogether there was less to worry over. A lively discussion ensued. Members admitted that in rougher land the disc drill may do the better work, but in clean land the hoe drill was preferable, covering the seed better, and cultivating the soil to more even depth.

Mallala, July 6.

Present—Messrs. McCabe (chair), H. B. Moody, Laller, A. Moody, Wilson, Temby, Churches, Worden, Nevin, Jenkins, Marshman, Stephenson (Hon. Sec.), and three visitors.

Grubs in Crops.—Mr. Loller referred to damage by grubs to late-sown wheat crops. Mr. Wilson had seen it stated that on Yorke's Peninsula the grubs were destroyed by driving a heavily laden dray around the infested patches. The Chairman suggested driving sheep over the ground when it was wet. [Try rolling with heavy roller, and harrow lightly after.—Ed.]

Annual Report.—Ten meetings held, with good average attendance. A prepared subject has been dealt with at each meeting. Mr. J. McCabe was elected Chairman, the Hon. Secretary being re-elected.

Cultivation of the Growing Crop.—Mr. A. Moody read a paper on this subject. In most parts of the world the cultivation of the crop after it is up receives considerable attention, but in South Australia very little is done to the land after the crop is sown. In some cases the crop may be rolled or harrowed, but too little thought is given to cultivation most suitable or to the time when it should be done. Sometimes it is rolled when the surface is already set, and harrowing is required; at other times land already too loose is harrowed instead of being rolled. Sometimes harrowing is done when the plants are not properly rooted, tearing out the plants, or otherwise injuring them. Harrowing when the ground is wet is also a mistake. His experience in the after-cultivation of the crop had been confined to the two operations of rolling and harrowing, and through press of other work the operation has not always been performed at the proper time. Crops harrowed when the seasons have been fairly favourable have benefited considerably. In dry years they have done quite as well as those not harrowed. Hoeing the crop would probably be beneficial where the plant has sufficient moisture to grow vigorously and the land has a tendency to become hard, but this practice is out of the question unless they were to drill in the seed in rows wider apart. On light land, and with a scanty rainfall, he did not think hoeing would prove as beneficial as other methods of cultivation. He felt certain, however, that in any fairly good season a suitable system of after cultivation of the crop will more than repay the cost. Land that is too loose or has been badly prepared can be consolidated, and takeall or rootfail prevented. Grubs and other insect pests will be considerably checked, late-growing weeds destroyed, the moisture conserved, and growth generally stimulated. For light or loose land he advised rolling when the crop is far enough advanced; the soil must be neither too wet nor too dry. He considered a roller of fairly large diameter much superior to the small but heavy rollers generally used; the latter push the soil ahead of them, and injure the roots of the plant. After rolling get over the ground as quickly as possible with harrows or other suitable implement to mould the plants up without burying them too much. On stiff land, unless very rough, rolling was not advisable; instead he would cross harrow. With stiff land it was advisable when putting in the crop to avoid working it too fine, otherwise it is likely to set too hard after rain. Mr. Lolier stated that he harrowed and rolled 20 acres of crop as an experiment, and got fully 5 per cent. more hay. On 100 acres of harrowed crop he increased the yield by 10 cwt. per acre. He would roll light land, and then harrow. Mr. H. B. Moody had seen a crop benefited by scarifying afte the plant was up; but they would have in every case to consider their special conditions. He favoured harrowing as a general practice in preference to rolling.

Clare, July 10.

Present -Messrs. Kelly (chair), Christison, Lloyd, Greenway, Hague, Hope, Martin, Carter, A. P and W. S. Birks (Hon. Sec.), and one visitor.

Rugging Cows. Members were agreed that the judicious adoption of this practice would be beneficial in this cold district.

Officers - Messrs. W. S Birks and H. H. Greenway were elected Chairman and Hon Secretary respectively. A special vote of thanks was accorded to the retiring Chairman (Mr. W. Kelly) for his services during past 12 years.

Malting Barley.- Mr. Christison read a paper on this subject. He could see no reason why good malting barley should not be grown in this district if reasonable care and judgment, especially in harvesting the crop, are exercised. The soil and climate appeared to be suitable, the price for good malting barley was nearly always satisfactory, and yields were much heavier than of wheat. On suitable land for barley they could expect up to 40 bushels per acre of barley, where they would not get more than 20 bushels of wheat. Whereas wheat, as a rule, gives the farmer 2/6 per bushel, malting barley rarely fetches less than 3/6, making a return of £7 per acre, as compared with £2 10/ from wheat. If the barley is improperly harvested —and the harvesting is a most important item- the farmer can readily get 1/6 per bushel, which would give a better return than wheat In various suitable localities in this State crops of 40 bushels per acre of barley had been grown in the past. He did not, of course, suggest that wheat should be given up in favour of barley, but that they should give some attention to a profitable branch of farm work. The best barleys are grown on sandy loam, with good rainfall, but with the exception of heavy clay land it can be grown satisfactorily on most soils; the limestone soils in this district should suit admirably. There were several varieties of barley used for malting purposes, but the two-rowed varieties were generally preferred. The best variety was the Chevalier, though a fairly large amount of Cape barley is now used for malting, and has the advantage to the farmer of a thicker skin, and is therefore less liable to damage in reaping. The greatest of care must be exercised in reaping; the barley must be dead ripe, and cannot safely be stripped in very hot weather, owing to the liability of damage to the skin, and the grains being broken by the beaters. Very little experience would teach any observant farmer when not to strip and how to adjust the machine. It was better to have the sample too rough than too smooth, with consequent risk of injury. From the maltster's point of view it was essential that the grain be plump, mature, and free from damage, as his object is to get grain with the highest possible capacity for germination, hence the necessity for care and judgment in reaping and cleaning operations. As the skin and other useless parts constitute about 30 per cent. of the entire grain, it will readily be seen that a thin skin is an important item. Thick, coarse-skinned barley carries a high proportion of waste. It is a common thing for a sample of barley to be refused solely on account of the damage done by reaping. A good sample of barley possesses the following characteristics:--Vitality, condition, maturity, good colour, also, in a less degree, size, weight, evenness, colour, appearance of skin, and age In buying a sample of barley the maltster looks for the percentage of broken skinned and cracked grains, dirt, and foreign grain. Colour, if bad, does not necessarily condemn a sample, but shows it has been in bad company, such as wet weather, or heating through reaping green. Weight, size, and evenness are all good points, but a floury, mellow interior, bright golden colour, and clean odour are the chief guides.

Koolunga, July 10.

Present.—Messrs. Butter (chair), Button, Shipway, Lawry, Sandow, Palmer, Jose, Pengilly Perrin, Atkinson, Buchanan, Cooper, Butterfield, Burgess, and Noack (Hon. Sec.).

Seed Wheat.—Dr. Cobb's pamphlet on this subject was discussed at length. The Chairman explained the meaning of the various diagrams, showing the different grades of wheat. One experiment he would like to see tried was the sowing of a measured bushel of large grain and of small grain over given areas, to determine which would produce the largest return. Mr. Palmer disagreed with Dr. Cobb on the question of change of seed, but others thought that much would depend upon the extent of the climatic differences; for instance, they thought that seed obtained from Mount Barker for sowing in this district would probably not give satisfactory results the first year. Several of the members advocated the grading of wheat for seed. Mr. Pengilly had for the past five years used a miller's drake screen, and had not heard much of small wheat in his crops lately, and believed strongly in good plump grain for seed. Mr. Button thought bleached wheat was better than unbleached wheat for seed.

Sparrows.- The question of the destruction of sparrows was discussed, and a motion "That the Government require all district councils to take up this matter" was carried unanimously.

Work of Branch.- This being the annual meeting, and all the members being present a ballot for papers for next 15 months' meetings was taken, and programme arranged.

Bare Patches.– Mr. Butcher called attention to the bare patches occurring on the Broughton flats and elsewhere; these patches appear to be increasing in area and number, and he would like to know what steps should be taken to get the land tested, with a view to ascertaining what treatment was necessary.

Morphett Vale, July 21.

Present—Messrs. Christie (chair), Perry, Anderson, McLeod, Jones, Hutchinson, Benny, A. and F. Pocock, and Bain (Hon. Sec.).

Officers.—Messrs. J. R. Bain and Thos. Anderson were elected Chairman and Hon. Secretary respectively for ensuing year.

Impaction.—Mr. A. Pocock recommended common chopped aloes mixed with a little bran as a cure for impaction if given early.

Foxes.—Mr. Christie said he had captured a fine large fox, which had been destroying his lambs.

Watermelons for Pigs.—Mr. Hutchinson stated that, having a considerable quantity of watermelons, he had been feeding them to the pigs, and found the animals thrived and fattened on the diet.

Port Elliot, July 18.

Present—Messrs. McLeod (chair), Gosden, Williamson, Brown, Pannel, Gray, Welch, Hargreaves (Hon. Sec.), and one visitor.

Flaxgrowing.—Mr. Williamson read extracts from Australasian on flaxgrowing in Gippsland, and it was decided to write for information to the farmers reported to have grown flax successfully.

Swine Fever.—The Chairman read extract from Victorian paper dealing with the outbreak of swine fever in that State. Members expressed the opinion that steps should be taken by the department to stop the importation of pigs owing to the danger of introducing the disease. [On June 24 a proclamation prohibiting the introduction of pigs from States infested with swine fever was issued.—Ed.]

Saddleworth, July 18.

Present—Messrs. Frost (chair), Adams, Bee, Eckermann, Leeder, Hannaford, Scales, and Coleman (Hon. Sec.).

Annual Report.—Report is for eight months only, suggestion from officers' conference to end the Bureau year on June 30 being adopted. Eight meetings held, with average attendance of 8.5 members, a falling off on last year's record. Four papers have been read, and a lecture on sheep by Mr. G. Jeffrey arranged. A 20-acre wheat contest under the auspices of the branch brought forward 12 entries, and the average returns were over 25 bushels of wheat per acre and 2 tons 8 cwt. of hay. A large number of varieties of wheat have been grown experimentally, and experiments with manures are being carried out this year.

Sheep on the Farm.—Mr. Eckermann read a short paper on this subject. He advised buying and selling sheep when in proximity to the market. He preferred ewes to wethers for fattening. Sheep not only brought in revenue directly, but they saved the butcher's bill, and saved much labour in keeping the farm free from weeds. Mr. Adams read an interesting paper detailing memories of the early days in South Australia.

Bowhill, July 11.

Present—Messrs. Norman (chair), Tyler, Johnson, Burton, Waters, Drogemuller, Weyland, and Whitfield (Hon. Sec.).

Visitors.—The Hon. Secretary urged members to endeavour to bring at least one friend with them to the meetings of the branch. They should do their best to welcome visitors and permit them to enter freely into all discussions.

Pickling Wheat.—In reply to question, members advocated pickling seed wheat at least nine days before sowing.

Poultry.—Mr. Norman read a paper on this subject, in which he strongly advocated the keeping of poultry on the Murray Flats. The climate was very suitable and food was cheap. He contended that it would pay to give more attention to this industry. The houses should be of stone and iron, or all iron, so that they can be easily kept free from vermin. Up to 100 fowls can be kept in one house, with a run of about 10 acres. This land should be ploughed up every year and sown with wheat or barley to supply green feed and to keep the soil sweet. He found that under local conditions 20 bags of wheat was ample feed for 100 fowls per annum, and that with a good laying strain 100 fowls would produce £30 worth of eggs per annum. Under average conditions the same amount of wheat would only sell for £10. The work of attending to the fowls was light, and most of it could be performed by the younger children, who, if allowed some commission on returns, would take a lot of interest in their work.

Kapunda, July 4.

Present—Messrs. Shannon (chair), Holthouse, Teagle, S. A. Harris, Kerin, Pascoe, Weckert, Banyer, and G. Harris (Hon. Sec.).

Plump v. Shrivelled Grain for Seed.—Mr. Banyer read a paper on the above subject. The question of the respective merits of plump and shrivelled grain was an important one to farmers. If the same result followed from the use of shrivelled grain as from plump and heavy grain, it would be better to use shrivelled, as weight for weight the shrivelled would go further than the heavier grain. He briefly referred to the conclusions arrived at by Dr. N. A. Cobb, of New South Wales, reference to whose experiments had been made in The Journal of Agriculture for June. Dr. Cobb's conclusions were in favour of the use of plump grain, the superiority of which was apparent all through his experiments. A larger proportion of the plump grain germinated than the shrivelled the plants developed better, and the yields were in far the greater number of cases considerably superior. The weight per bushel of grain from plants of plump seed was greater than that of grain from plants of lower grade. Farmers knew the value of heavier wheat when selling and the standard bushel was evidence of the importance that buyers placed on the question of plump and shrivelled grain. Mr Banyer said Dr. Cobb's experiments bore out his contentions in a paper on "A Grain of Wheat," read before the branch two years ago, and printed in The Journal of Agriculture of July, 1901 Most of the members supported Dr Cobb's conclusions in favour of plump grain for seed, considering it as reasonable to expect to breed first-class animals from inferior stock as to hope for the best returns from shrivelled grain The Chairman stated on one occasion he sowed plump and shrivelled seed side by side and got returns of 20 bushels and 6 bushels per acre respectively Mr Kerin had sown small grain and large grain side by side but could see no difference in results Mr. Banyer pointed out that it was not altogether a question of small versus large grains, some wheats naturally produced grains smaller than other kinds. It was a question of plump grain as against shrivelled grain

Whyte-Yarcowie, July 18.

Present—Messrs Hack (chair), Hatherly, Mitchell, Pascoe, Mudge, Faul, McLeod, Dowd, Boerke (Hon Sec), and two visitors.

Manures—Mr Faul read a paper on this subject, referring to experience with fertilisers for wheat in South Australia. This experience had strongly emphasised the fact that in all the drier districts water-soluble phosphates were essential. There were a number of brands of superphosphate on the market, and, apart from the actual analysis, the farmer should consider two other important points, viz., friability and dryness Mr. Pascoe stated that some bags of superphosphate he had received contained about 40 lb. less than the alleged weight. Mr. Mitchell had the same trouble last year, but the bags tested this year were full weight.

Grading Seed Wheat.—Dr. Cobb's report on the grading of seed wheat was discussed at length. The majority of the members were convinced that the best crops can only be expected from the best seed Two members instanced good crop from shrivelled seed obtained from Riverina; in this case there was both change of soil and climate in addition, and the crop was quite equal to that from good, plump local seed.

Harrowing Growing Crops.—Mr. Dowd reported that he had experimented in this direction, and was quite satisfied with the result so far, but he advised harrowing after the wheat is several inches in height, as otherwise the plants would be covered, and probably perish.

Sandalwood for Fence Posts.—Mr. Hatherly found that sandalwood posts were inferior to mallee or pine, a fact which Mr. Mitchell, who advocated their use, admitted; but he claimed that well-seasoned sandalwood posts would last for many years. General experience of members was that posts will last better if cut when the sap is down, February to April being the best time in this locality.

Ardrossan, July 11.

Present—Messrs. Freeman (chair), Wilson, C. and R. Dinham, Henderson, Cornish, Woods, Allison, and Opie (Hon. Sec.).

Poultry.—Mr. Cornish read a paper on this subject. He pointed out the necessity for choosing breeds according to the purpose of the farmer. For table fowls they wanted the heavier, meaty birds, and to get the requisite fulness in the breast the game breeds crossed with the Dorking, Orpington, or Plymouth Rock, would give satisfaction. Of the laying breeds he preferred the White Leghorn. Birds for table should be sold as soon as ever they are fit. Soft food in the morning and grain at night should be given. The grain is better scattered in some old chaff to make them scratch for it. Overfeeding must be avoided. Clean water, grit, crushed bones or shells are essential, and a little meat food should be given occasionally. All the old hens should be disposed of before they become unprofitable. Cleanliness must be observed and overcrowding avoided. Vermin can be kept down by spraying the houses and perches occasionally with a solution of carbolic acid. If properly managed poultry will give a high percentage of profit, and if the farmers would give them more careful attention they would get considerably increased returns. A resolution generally endorsing this was carried. Some difference of opinion existed on the respective merits of the breeds. The use of stinkwort or flowers of sulphur in the nests, &c., as a preventive of vermin was recommended by Mr. Dinham.

Bute, July 7.

Present—Messrs. Trengove (chair), A. and H. Schroeter, Ebsary, Haldane, Stevens, McEvoy, Sharman, Barnes, Cousins, Commons, Gitsham, Brideson, and Masters (Hon. Sec.).

Analyses of Soils.—Mr. McEvoy initiated a discussion on the establishment of a Government analytical department for the purpose of testing soils, and advising what manures were required to supply their deficiencies in plant foods; and also what was the best treatment under special conditions. Every farmer should know what elements were deficient in his soils, but the cost of obtaining this knowledge under present circumstances was practically prohibitive, and he thought that, as it was to the interests of the State that the farmers should produce as much as possible from the land, the Government might reasonably be asked to undertake these analyses free of cost. Mr. Sharman supported, but the rest of the members held that the farmers were too independent to expect the Government to undertake this work for nothing. While there was no doubt the State as a whole would profit by the increased crops that might be obtained, the grower benefited directly to a far greater extent, and should be prepared to pay reasonable charges for any analyses desired. The Hon. Secretary thought they would benefit far more from experimental work on their farms than from soil analyses. A motion favouring Mr. McEvoy's suggestion was defeated by 11 votes to 2.

Pine Seedlings.—Mr. Hamdorf wished to know how to raise seedlings of the common native pines. Mr. Brideson simply planted the pine cones, and found the seed germinated the following year.

Pickling Seed Wheat.—The Chairman had planted wheat two months ago, and, although it sprouted, it did not come through. Mr. Schroeter suggested use of too strong a pickle, which would cause a weaker plant, without strength to push through the surface compacted by rain. He thought harrowing would have proved beneficial. The Chairman stated that he used 12 oz. of bluestone to the bag of seed, which members thought too strong a pickle.

Fallowing Sand.—The Chairman asked how to treat land that was inclined to drift; when should it be fallowed, and to what depth? Members thought the land should be ploughed while wet, and generally about 8 in. in depth.

Bleached Wheat for Flour.—Report of trials with bleached and unbleached wheat for flour was discussed. Members expressed their appreciation of the action of Saddleworth branch in securing trial by Mr. Guthrie, of Sydney, of the quality of bleached wheat.

Finniss, July 13.

Present—Messrs. Chibnall (chair), Langrehr, Heath, T. and S. Collett (Hon. Sec.).

Dairying.—Mr. Chibnall read a paper, "The Story of a Pound of Butter," in which he gave expression to the opinion that there was too much inspection and often in the wrong place. He also read a paper on rugging cows. He had followed this practice during the past two winters, and was certain that it was a great help in keeping the cows in good condition, besides increasing the flow of milk during the winter, and this year he had noticed that the cows in milk that are rugged look better than the unrugged cows feeding in the same paddock. He used the ordinary wheat sack in good condition· threadbare bags were of very little use. He cuts the bag down one side and the end, and plaits binder twine, three strands, for cords; one cord for each corner and one for the middle of each side. The cords are sown to the bag; making holes was a great mistake. The bag is then placed across the cow with the old seam across the middle of the back. The cords at the breech are tied, then the rug is drawn up to the neck and the cords round the neck and under the belly are fastened. The latter cords should be fairly tight, as they will become slack by morning. The cords on the opposite side to that on which the milker sits should be double the length of the other cords, so that they are tied up close to the edge of the rug out of the milker's way. In taking off the rug, untie the neck and belly cords and draw it off. Rugs made from bags become waterproof in about 10 days from the absorption of the grease from the cow's body. The better the condition of the cow the sooner will the rug become waterproof. He had his doubts respecting the lined rugs that were being sold; unless they were taken to pieces regularly and cleaned, which he was afraid would not be done very often, they would probably become foul and a harbour for vermin. With bag rugs they can easily be turned, and if they get dirty they can be burnt and replaced at very little outlay. The rugs should only be put on at night unless the day temperature falls to 60 F., or the paddock is very bleak. He was trying the effect of rugging hand-fed calves, as keeping them in an enclosed yard at night was not the best for them unless the yard was kept perfectly clean. Members were convinced that rugging the cows in the cold weather was a profitable practice.

Mundoora, July 10.

Present—Messrs. Harris (chair), Allen, Beck, Mildren, Loveridge, Blake, Mitchell, Button, Angley, Aitchison, Tonkin, Shearer, Gardiner (Hon. Sec.), and two visitors

Sheep Complaint.—Messrs. Harris and Blake had had sheep affected by some complaint causing lameness, the leg joints being stiff and swollen; in one instance sheep were affected during the summer, and in the other quite recently. After a few days the animals appeared to get all right.

Sparrows.—The Hon. Secretary thought that, as sparrows would at this season of the year have great difficulty in getting any grain, it would be a good time to distribute poisoned grain for them.

Johnsburg, July 4.

Present—Messrs. Potter (chair), Dunn, Sparks, Masters, Luckraft, Caughlan, Hombach, Chalmers, and Johnson (Hon. Sec.).

Breeding Horses.—Mr. Luckraft read a paper on this subject. In his opinion it would pay them much better to breed pure draught horses than the crossbreds and mongrels so often seen on farms; the former would be worth £30 to £80 when fit to break in, while the latter might fetch £7 to £12, and cost just as much to rear. The mare should be a good, roomy animal, and measure up to standard. As the foal takes more after the sire than the dam, the greatest care should be exercised in the selection of the stallion. When ready to wean, the foal should have careful attendance and plenty o feed; for the first twelve months it was most important that the foal should be well fed, and not be checked in its development. For good roadster horses he would mate good draught mares to a blood stallion in preference to the reverse cross. Members generally agreed with the paper, and attributed the degeneration of their farm horses to the very few importations of good draught stock of late years. Members considered pure bred stock most suitable for most localities. Some of the members thought the progeny of a good draught stallion and a medium-sized mare suitable for farm conditions in the northern areas, as they get over the ground quicker and do more work than a heavy animal. The Chairman stated that he had several horses which, owing to defective teeth, had not been doing well. He had their teeth attended to, with the result that they rapidly improved in condition. Mr. Dunn reported similarly; some of his horses prior to the operation could not chew their food, but now they could do so as well as ever they could. The operation was simple, apparently caused but little pain, and it was not necessary to throw the horse.

Annual Report.—The report showed fair progress during the year, in spite of adverse circumstances. Nine meetings had been held, with an average attendance of eight members. Four papers had been read and discussed. Mr. Chalmers was appointed Chairman, and the Hon. Secretary re-elected. It was decided the absent members be informed that the attendance rule will be strictly enforced.

Lucindale, July 18.

Present—Messrs. Feuerheerdt (chair), Matheson, Dow, Beaton, Hensley, Tavender, Carmichael, and Dutton (Hon. Sec.).

Sand in Sheep.—The Chairman reported having opened a sheep which was found in a dying condition, and found the stomach full of sand. Members considered it very unusual for sheep in this district to be sanded.

Wattle Growing.—The Chairman referred to paper by member of Yankalilla Branch on this subject. It was there recommended to clear the land before sowing the seed In this district it was much better to sow the seed in amongst the ferns as the young plants were protected from frost, &c. There was, of course, the danger from fire in the fern land, and members thought it was this danger that prevented many from sowing wattle on fern land

Crystal Brook, July 4.

Present Messrs. Pavy (chair), W and A Hamlyn, Davidson, Miell, Hutchison, Venning, Townsend, Morrish, Weston, Dabinett, and Symons (Hon Sec.).

Annual Report – Eleven meetings held, with average attendance of nearly 10. Nine of the members have read papers, none failing to take their turn as balloted for. The annual conference of northern branches held in February was very successful.

Stock Markets.—Mr. Weston read a paper on this subject. He considered the stockraisers were placed at a great disadvantage owing to the absence of regular sales of stock, &c. This was particularly so with those to the west and south of Crystal Brook. Stock had to be driven to Gladstone for sale. With sheep this meant starting the day before the sale, entailing loss of time and deterioration in condition of sheep travelling 15 to 20 miles on a bare road. Then sometimes it involved a stay of two nights at Gladstone, incurring further expense and loss of time. Often they parted with their sheep for 6d. and in small lots even 1/ per head less than they should rather than wait another day. Then there was the anomaly of sheep taken from the district to the sale being bought by local butchers and brought back again. He was convinced that if a regular monthly sale was held it would increase the value of land in the district and the revenue of the stockraisers. It would be to their interest to unite to endeavour to get one of the large firms to start regular sales at Crystal Brook.

Mount Remarkable, July 9.

Present—Messrs. Jorgensen (chair), Challenger, T. P. and G. P. Yates, Foote, Kaerger, Morrell, McIntosh, O'Connell (Hon. Sec.), and one visitor.

Annual Report.—Twelve meetings held, with an average attendance of 8.6 members. Four papers have been read and a number of very interesting discussions have taken place. Professor Towar had visited the district and given a very instructive address.

Rugging Cows.—Considerable discussion on this subject took place. All the members believed in the principle, but those with large herds thought that it was impracticable. Nearly all the cows in the township have been rugged this winter. It was decided to see whether it was possible to establish a butter factory at Melrose.

Hawker, July 8.

Present—Messrs. Borgas (chair), O'Loughlin, Wardell, Pumpa, Schuppan, and Smith (Hon. Sec.).

Horses v. Mules.—The Hon. Secretary read a paper on this subject. He admitted there was a rather general prejudice against mules, but this in his opinion, was not warranted. Some mules were undoubtedly of very little use, and gave a bad name to the whole lot, but they had useless animals in all breeds of stock. A good mule, however, was a strong, hardy animal, which would do twice as much work on the same amount of food as a horse; in fact, a mule would do well where a horse had not sufficient food to keep in working fettle. Where they lack strength of a draught horse they make up in endurance. On the farm he believed they would do quite as much work as an equal number of horses. For station and other work where the draught is not too heavy they could not be beaten. They are very hardy and free from disease, and require much less attention than horses. A mule will eat almost any kind of food, whereas horses will frequently pick and choose, and suffer from indigestion, colic, and other trouble. Mules will also last longer than horses. He had no wish to run down the horse, but one of the lessons taught them by the drought was that under their conditions the horse was a very expensive animal to keep, and if they can get another animal to do their work at less expense it was to their interest to do so. He believed that mules bred from good stock would be the cheapest and most useful animal for them. Members were divided in their opinions of the possibilities of mulebreeding to take the place of horses on their farms.

Orroroo, July 17.

Present—Messrs. Moody (chair), Jamieson, Copley, Brown, Lillicrapp, Roberts, Matthews, Robertson, Oppermann, and Tapscott (Hon. Sec.).

Poultry on the Farm.—Mr. Brown read a paper on this subject. While nearly every farmer keeps some fowls there were very few poultry farms. Too often the fowls on the farms are left to look after themselves, and no attention is paid to their improvement. To make fowls really profitable breeding and feeding must receive careful attention, just the same as other farm stock. He preferred pure-bred fowls both for laying and for table purposes. He had considerable experience in breeding and showing fowls, and could claim to have been fairly successful. Of all the breeds he had reared he preferred the Andalusian for egg production. Crossed with the Langshan they got a fair layer and a good table bird. Mr. Jamieson considered it a mistake to keep too many birds; a fewer number well looked after were more profitable. Mr. Lillicrapp was very successful with both Minorcas and Leghorns for eggs. He liked the Plymouth Rock also, as it was a good [illegible], a nice table bird, and a fairly good layer. Mr. Matthews found the White Cochin good both for egg production and for the table. He advised the use of portable iron houses to be moved from place to place on the farm. These houses were easy to keep free of vermin.

Caltowie, July 6.

Present—Messrs. Hewett (chair), Kerr, Leahy, J. and A. McCallum, Petatz, Potter, Royal, Connors, Neate, Graham, J. G. and F. Lehmann (Hon. Sec.), and six visitors.

How to Make Farming Pay.—Mr. Hewett read a paper on this subject. He advocated thorough cultivation of the land. All weeds must be kept down on the fallow; some farmers plough up more land than they can work properly, afterwards trusting to being able to get a flock of sheep to eat off the weeds before they seed. Often this cannot be done at the right time, and the rubbish seeds all over the fallow. Three hundred acres well worked will give more crop than 400 acres slummed, and entail less labour and wear and tear on implements; in addition, there will be the benefit of the extra 100 acres for grazing. All farm implements should be kept in good order, and when not in use kept under cover. It was quite common for the implements to be left out where last used, or used to block up panels. Attention must be given to dairy cows, pigs, and poultry. He frequently heard farmers say it did not pay to keep poultry, but after a number of years' experience he had come to the conclusion that it was one of the best sources of income on the farm. There was relatively little labour or expense attached, though sometimes they were somewhat of a nuisance about the stables and haystack On a farm, where the birds get little attention and plenty of freedom, he considered the cross between the Minorca and the Leghorn most profitable. They are hardy, good layers, and fairly plump birds for table. In the summer, when green feed is scarce, he found piemelons a good substitute, and much appreciated. Although dairying was not so profitable here as in some other districts, he held that the cows, properly looked after, would prove a gratifying source of revenue. With pigs, he favoured the cross between the Berkshire boar and white Yorkshire sow; the progeny grow quickly, are hardy, and thrive well. At six to seven months old he had frequently got as much as 12/ to 14/ each for them; at twelve months they will weigh up to 200 lb. It would not, however, pay the farmer to buy feed for pigs; he should only keep enough to consume the feed he has on the farm. If farmers would clean their wheat better they would have a lot of small grain for pigs and fowls and, instead of being docked by the wheatbuyer, they would get full price for their clean wheat. Mr. Kerr favoured the Poland China-Berkshire cross in preference to that advocated by Mr. Hewett; he could not agree that poultry were very profitable, while they were undoubtedly a great nuisance in the stable and hayyard. More attention should have been given to sheep by Mr. Hewett Members generally seemed to agree with Mr. Kerr in regard to poultry. In reply, Mr. Hewett said that, while the Yorkshire pig was rather coarse in the flesh, when crossed with the Berkshire the progeny was very profitable. He maintained that if reasonable precautions were taken poultry were not a nuisance, while they were certainly profitable.

Burra, July 10.

Present—Messrs. McDonald (chair), Dawson, Arnold, Duldig, Hawkes, Scott Goodridge, and Harvey (Hon. Sec.).

Grading Seed Wheat.—Attention was called to error in report in July Journal on this subject. Mr. McDonald stated that, by thoroughly winnowing their seed wheat they removed 10 lb. to 12 lb. of small grain, &c., from a bushel of wheat, and not that the weight per bushel had increased to the extent of 10 lb.

Mangels.—Mr. Dawson tabled two very fine mangels weighing 32 lb. and 20 lb. respectively, grown without irrigation from seed planted last August. Stable manure was applied to the land, and the crop kept free from weeds He was feeding mangels to both cows and pigs with very satisfactory results.

Fattening Pigs.—Members consider pollard and crushed wheat best for this purpose; pollard alone will fatten the pigs quickly, but the bacon is likely to be too fat.

Clarendon, July 17.

Present—Messrs. Juers (chair), Spencer, Brooks, Payne, Dunnill, Phelps, Piggott, Morphett, Harper, Wright (Hon. Sec.), and one visitor.

Dairying.—It was decided to purchase a pure-bred Shorthorn bull to cross with the Jersey strains now in most of the members' herds. A subcommittee was appointed to select a bull.

Thieves and Robbers.—Mr. Spencer read a paper on this subject. He found it rather difficult to define what was a robber on the farm. At one time a certain thing might be beneficial, at other times it was not required, and could only be regarded as a robber. There were quite a number of pests deliberately introduced by well-meaning settlers in the early days. Of these the sparrow—most destructive of the feather tribe—and starling might be mentioned. Then in plants they had the stinkwort, briers, "stagger weed, &c., all of which were robbers. Of the rabbits, they knew only too well the extent of their depredations, and of the difficulty in coping with them. Hares were also troublesome, and now one of the greatest of all thieves, the fox, had invaded the district; it is true that many claimed that he would greatly reduce the number of rabbits, but his work in other directions would be serious. Of their native birds, the magpie at times was a serious robber, while the crow comes under the same designation. Another thief to contend with was the wheatgrub, which is playing havoc in the crops in many parts.

Forest Range, July 7.

Present—Messrs. Monks (chair), A. H. and R. Green, Townsend, Vickers, Gunn, Rogers, Waters, McLaren, Hackett, F. Green (Hon. Sec.), and one visitor.

Annual Report.—Twelve ordinary and three special meetings held during year, with average attendance of over ten members. Five papers read, three special addresses by visitors given, and a successful Conference of Hills Branches arranged. A Special Committee has been appointed to enquire into the prospects of starting a cider and apple vinegar factory in the hills district.

New Industries.—Mr. Waters read a paper on "Industries Worthy of Attention," contrasting what he termed the "go-ahead" character of the Victorian settlers with the "dead-slow" habits of South Australia. When the grand resources of South Australia were considered, it must be admitted that, with the exception of wheat, wine, and wool, they were not giving the attention warranted to their possibilities of profitably utilizing their land. One thing specially seemed neglected, and that was the growing of plants producing oils, and the extraction of those oils. Amongst these were linseed, rape, mustard, and probably cotton. If these products were grown and an oil mill established a large and important industry, employing many people, would be established, and there was every prospect of the establishment of a profitable export trade. The many uses and value of the different oils were referred to, and the utilization of the by-products for feeding stock and as manure were mentioned. In view of the large amount of money sent out of the State every year for these products, it seemed surprising that none of their wealthy men had taken up this question. There was also another important industry that might be worth their attention, and that was paper making. This industry would employ a large number of people, and as they wanted population to develop their resources, and at the same time were importing so many thousands of pounds' worth of paper yearly, there should surely be a good opening for a paper mill here. Mr. Waters referred to the materials utilized for paper making, so much of which was waste products, including old rags, paper, fibres, straw, &c. Another industry they might take up was the pulping of raspberries. The past season should have been an object lesson to them as growers, and it behoved them to consider how best to dispose of their fruit in the future. Why should they not co-operate to erect a plant to pulp the surplus raspberry fruit, and so maintain a fair price in local markets: So far as he could see if only a dozen of the largest growers would combine the whole aspect of the raspberry industry would be altered, to the advantage of all concerned. [Mr. Waters can rest assured that, were the prospects of the profitable production of oil as satisfactory as he paints them, there would be no lack of enterprise on the part of our merchants. In spite of the fact that the industry has been very heavily subsidized by the Victorian Government, we are afraid that the present position is not such as holds out any hope of doing much in this direction in South Australia, especially while it is possible to earn more from the land in other directions. Rape linseed, and mustard will all grow well here, but the prices that a millowner could pay for the seed would not leave much, if any, profit to the grower. Practically, the same applies to the paper-making industry. Only very large mills near to large supplies of raw products, most of which do not exist in South Australia, and also in proximity to large centres of population, can be profitably engaged in this industry - Ed.]

Kanmantoo, July 10.

Present—Messrs. Lehmann (chair), Lewis, Mullins, Hair, E., R. H., and J Downing (Hon. Sec.), and two visitors.

Rugging Farm Stock.—A lively discussion ensued on the question of rugging horses and cows during the cold weather, and it was generally agreed that, if stabled or properly rugged, they required less feed, and did better on it than animals exposed to the cold.

Crop Dying Off. Mr Lewis reported that on about 7 acres of land not previously cropped with wheat the plant had died off, althougt it came up well, and on either side the crop was still thriving. Members advised sowing barley or peas on the patch Mr. Lehmann reported that on about 50 acres of land he was afraid the crop would not come through. The land had been well cultivated by heavy rains directly after drilling, and caused the surface to set close.

Morchard, July 10.

Present Messrs Scriven (chair), Kitto, Kirkland, Longbotham, Piggott, O'Loughlin, Toop McKenzie, Kummnick (Hon. Sec.), and one visitor.

Pigs. Mr. Toop read a paper on "Rearing, Fattening, and Marketing of Pigs." He had found it profitable to enclose the farm with netting, and to let the pigs have free run, as they do no harm from January to the time the wheat comes into ear. Good foragers were wanted, a cross between the common rough sows and Poland-China boars produce the largest litters, and the pigs running at large will weigh heavier than other breeds; at six months they should scale about 120 lb. He considered the Poland-China, pure, a good breed, but crossed with the Berkshire it was only fair. It was necessary to shut up the pigs for three weeks prior to killing, and to feed on some grain, preferably crushed. Three weeks is sufficient to get the flesh firm; for bacon the pigs should be fed in the sty for a longer period. In ordinary seasons there was always a lot of dirty and small wheat, oats, &c., on the farm, all of which could be profitably utilized in topping up pigs. With pork at 5d. per lb., it was possible to make 5/ for every bushel of wheat fed to pigs. Feed three times a day when fattening, but not too much at a time. The pigs should not be allowed to get very hungry. It was best to mix the grain with skim milk. Care must be exercised in scalding pigs; if badly done the skin will look dark or yellow. For a pig weighing 150 lb. a trough of corrugated iron, 6 ft. x 2 ft. x 1½ ft., will be found a handy size; the water should be of temperature of about 169 deg. F., but in cold, windy weather it is as well to have it 1 deg. to 2 deg. higher. In warm weather, and with pigs carrying but little hair, 167 to 168 deg. will be hot enough. It was important that the temperature be ascertained by means of a reliable thermometer. When the hair comes off scrub a little, and then remove and hang the carcase to dry out of the wind. Pigs weighing up to 150 lb. will prove most profitable for porkers.

Weeds.—Attention was directed to several weeds prevalent in various parts this year.

Arbor Day.—It was resolved to hold an arbor day under the auspices of the branch.

DATES OF MEETINGS OF BRANCHES OF THE AGRICULTURAL BUREAU.

With a view of publishing in the "Journal" the dates of meetings of the branches of the Agricultural Bureau, Hon. Secretaries are requested to forward dates of their next meetings in time for publication

Branch.	Date of Meeting.		Branch	Date of Meeting.	
	1903	1903		1903.	1903.
Appila-Yarrowie	Aug. 7	Sept. —	Morphett Vale	Aug. 18	Sept. —
Arthurton	6	—	Mount Compass	—	—
Balaklava	8	12	Mount Remarkable	6	13
Booleroo Centre	4	1	Mundoora	—	—
Bowhill	8	12	Nantawarra	7	2
Brinkworth	7	4	Naracoorte	8	5
Burra	14	11	Norton's Summit	7	4
Bute	4	11	Onetree Hill	7	8
Caltowie	3	—	Orroroo	14	—
Cherry Gardens	11	8	Penola	8	5
Clare	7	4	Pine Forest	4	1
Clarendon	10	4	Port Broughton	6	3
Colton	1	5	Port Elliot	15	19
Crystal Brook	8		Port Lincoln	21	18
Elbow Hill	4		Port Pirie	8	5
Eudunda	10	7	Pyap	5	2
Finniss	3	7	Quorn	8	—
Forest Range	6	3	Red Hill	4	1
Forster	1	–	Reeves Plains	7	4
Gawler River	7	4	Rhine Villa	7	—
Gladstone	1	–	Riverton	1	5
Hartley	7	4	Saddleworth	15	18
Inkerman	4	1	Stansbury	1	6
Johnsburg	8	5	Stockport	3	—
Kanmantoo	7	4	Strathalbyn	17	21
Kapunda	1	5	Virginia	3	7
Kingston	1	5	Wandearah	3	7
Koolunga	6	3	Watervale	3 & 31	—
Lyndoch	6	—	Wepowie	5	2
Maitland	1	5	Whyte Yarcowie	15	19
Mallala	3	7	Willunga	1	5
Mannum	–	—	Wilmington	5	2
Minlaton	29	26	Woodside	3	—
Morgan	1	5	Yankalilla	7	–

VENTILATION OF FACTORIES AND WORKROOMS.

CONTRIBUTED BY THE CHIEF INSPECTOR OF FACTORIES.

(Continued from page 792.)

V.—ACCIDENTAL IMPURITIES *(continued)*.

The cotton wool is 6 in. thick, and is held in position by wire netting on a wooden frame. It was found by one of us to pass 1,500,000 cubic feet of air per hour, or 1,500 cubic feet per hour per square foot of surface, with a difference of pressure between the two sides of 4.2 m.m. (0.17 in.) of water, or 1.0 lb. per square foot. The pressure was produced by an ordinary propeller fan working at a rather high velocity. Laboratory experiments showed, further, that the flow of air through cotton wool, porous earth, and other similar materials varies directly as the pressure, and thus follows a quite different law from the flow of air through a constricted opening. A cotton-wool filter is apt to become blocked pretty rapidly during fog unless the air is warmed somewhat so as to keep the filter dry.

VI.—INFLUENCE OF IMPURITIES ON THE COMPOSITION OF THE AIR

It is evident that if no fresh air at all entered a room containing persons, and perhaps also burning lights, the air would very soon become exceedingly foul. The air of a perfectly air-tight room containing one person at work to every 250 cubic feet of air space would, for instance, at the end of an hour contain about 40 volumes of carbonic acid per 10,000 of air, and would smell very unpleasant. At the end of eight hours the air would be so foul that candles or lamps would not burn on account of the diminished oxygen percentage (a candle is extinguished when the oxygen percentage falls below 17.5); everything would be damp from condensed moisture; and more or less noticeable panting would be produced in the persons present by the accumulation of carbonic acid. Probably also most of those present would suffer from nausea and headache. If there were one ordinary gaslight to every three or four persons these effects would be produced in about half the time. Such a state of matters is, however, never observed in ordinary rooms. There are always means of some kind by which the air is constantly being changed, whether or not the ventilation is what would be regarded as adequate. On the amount of ventilation relatively to the rate at which the air is vitiated by the persons and lights present depends in the long run the degree of vitiation of air.

Supposing the air of the room to be pure at first, a certain interval will elapse before the impurity of the air reaches an amount beyond which it does not further increase. The larger the air space per person or per light in the room, and the less adequate the means of ventilation, the longer will be this interval. Thus let us suppose the common case that with no gas lit the carbonic acid ceases to increase at nine volumes per 10,000 (the legal maximum in humidified cotton cloth factories), or five volumes above what is present in the outside air of a large town in the winter. On the assumption that the air is completely mixed, and that each person produces about one cubic foot of carbonic acid per hour (see above), it follows that 2,000 cubic feet of air per person are entering the room. Hence, if there are 250 cubic feet of air space per person the air of the room is, on an average, changed about once in seven and a half minutes. With 1,000 cubic feet per person it is changed once in half an hour. In the first case, the carbonic acid present as impurity will have reached nearly (within about a seventh from) its maximum after 15 minutes, in the second case, after an hour.

With the common enough provision of one gas jet burning about eight cubic feet per hour (and producing four cubic feet of carbonic acid) for every 1,000 cubic feet of air space, the carbonic acid would, with the same persons present, the same air supply, and complete mixture of the air, finally reach 14 volumes per 10,000 in the first case, and 29 volumes in the second case

It will thus be seen that unless where the cubic space per person is very large, or the ventilation very bad, the degree of impurity in the air will, after a comparatively short interval from the time of commencement of work, depend not on the air space per person in the room, but on the volume of fresh air introduced per person and per cubic foot of gas burnt.

In the following table we have arranged the observations in Appendix I so as to show the relations between the air space per person and the proportion of carbonic acid in the air Where several analyses have been made of the air in one room the average for daylight or gaslight in that room has alone been counted in constructing the table, so that the general average may be as fair as possible —

Cubic feet per Person		Under 300	300 to 400	400 to 600	600 to 1,000	1,000 to 1,500	1,500 to 2,000	2,000 to 5,000	Over 5,000
Average cubic ft per person		233	339	496	760	1,227	1,689	2,906	9,404
Volume of CO_2 per 10,000	Daylight or Electric light	11.4	10.6	9.7	10.2	9.2	9.0	7.1	12.8
	Gaslight or Lamplight	20.1	13.6	14.0	13.8	17.4	19.0	17.8	26.3
Number of Rooms examined	Daylight or Electric light	36	33	28	27	27	25	24	25
	Gaslight or Lamplight	14	8	15	18	14	9	5	12

It will be seen from the table that there is no general decrease in the carbonic acid with increase in the cubic space per person, and, indeed, the highest results were obtained, curiously enough, in the rooms with most space per person This was evidently due partly to the fact that a large number of these rooms were spinning rooms, which are commonly kept tightly closed in order to prevent cooling or injury to the product from external atmospheric changes In gaslit rooms there is, on the whole, a marked relative increase in carbonic acid in rooms with a large cubic space per person This is explained by the fact that in such rooms the proportion of gas jets to persons is usually much greater than in rooms with a small cubic space per person. It is quite clear from the table that a large cubic space per person affords no guarantee for purity of the air. In factories and workshops, where rooms are always continuously occupied for some hours, foul air is about as often met with in sparsely occupied as in crowded rooms

(To be continued.)

INDUSTRY.

SUPPLIED BY THE DEPARTMENT OF INDUSTRY

Labor Bureau.

Number of persons registered and found employment by Government Departments and Private Employers from June 30 to July 27, 1903

Trade or Calling	Number Registered		Number Employed
	Town	Country	
Laborers and youths	52	56	116
Masons and Bricklayers	—	—	2
Carpenters	5	—	3
Boilermakers and assistants	2	—	6
Blacksmiths and strikers	5	1	1
Fitters and turners	5	—	1
Enginedrivers	1	1	—
Ironworkers	1	—	1
Carriage trimmers	1	—	—
Painters	4	—	1
Gardener	1	—	1
Farm hands	—	—	1
Compositors	—	—	2
Baker and Cook	3	—	—
Goods porter	1	—	
Apprentices	9	3	3
Cleaners	2	4	—
Rivet boys	5	—	7
Porters and junior porters	8	6	1
Totals	105	71	146

July 29, 1903.

A. RICHARDSON, Bureau Clerk

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DEPARTMENTAL NOTES AND WORK.

His Excellency the Governor has recently received a telegram from the Secretary of State for the Colonies intimating that all sugar imported into the United Kingdom after August 31, 1903, must be accompanied by certificate of origin. This, however, does not apply to sugar used in the preparation of such articles as jams, preserves, biscuits, and confectionery. All sugar imported into the other signatory states to the Brussels Sugar Convention requires this certificate, but His Majesty's Government is not aware yet whether a certificate is required in regard to articles in the preparation of which sugar is used.

Owing to the dislocation of work incidental to every removal to new premises we were unable to attend last month to the report of the July meeting of the Council of Agriculture, and to several reports of meetings from branches of the Agricultural Bureau which came to hand rather late in the month. In view of the large increase in the work of the department hon. secretaries of branches will oblige by forwarding their reports as early as possible, as under present conditions we find that it is often impossible to publish those reports which do not reach the office prior to the 26th of the month.

On August 12 the members of the College Committee of the Council of Agriculture paid a visit of inspection to Roseworthy College, and were shown round the fields by Professor Towar. The members were well pleased with the condition of the crops, and inspected with interest the various experimental plots, which will doubtless receive considerable attention on "Farmers' Day," Monday, September 14. During the month Professor Towar lectured at Strathalbyn before the local Agricultural Bureau.

In connection with the annual visit to Roseworthy Agricultural College, which will take place on Monday, September 14, the Hon. Minister has decided that this year a charge of 2/ will be made to cover portion of the expenses, and also with a view to avoiding the congestion that has obtained of late years and to enable those really interested in agricultural pursuits to visit the college. In view of the difficulties experienced during the past three or four years we are sure visitors will appreciate the change.

On Saturday, August 15, the students from Roseworthy College visited Mr. C. H. Angas's Kingsford Station, and inspected the prize Shorthorns and Herefords which were being got ready for the Melbourne and Adelaide Shows. It was certainly an instructive and enjoyable excursion; our only regret is that more of the prominent breeders are not located within easy reach of the College, where the students can benefit by the experience of men who have been successful in various lines of stockraising. On Tuesday, August 25, the third-year students attended the Kapunda horse sale, a large consignment of draught horses being offered by auction.

Mr. Thomson, Dairy Instructor, has finished the School of Mines lectures for the session. A number of his students preparatory to their entry to the Agricultural College will be better qualified to follow dairy education there. At the College Mr. Thomson has begun demonstrations on bacteriology as an introduction to the higher science subjects. Students will be educated in the dangers of uncleanliness in the dairy, how organisms act in the milk supply, and where contamination is first introduced. Prevention as a means of excluding taint-producing germs will be thoroughly dealt with. Four samples of milk have been analysed for butter fat and added water, four samples of butter have been examined for taints, and two quantities of cheese for defect in flavour and texture. At the Government Depot two shipments of butter have been treated for export to the London market. Supplies are expected weekly for the next few months.

During August 3,138 cases of fruit were imported and 125 cases destroyed. The importations consisted almost wholly of bananas, only a few cases of pineapples, passion fruit, and oranges being introduced. The cases which were destroyed contained a few bananas affected by larvae of a fly suspected to be the Tephritis Tryoni. These were chopped up and covered with carbolic acid, and the contents buried below the tide water level. Sixty-two parcels of plants, including five bales containing 1,782 fruit trees, were imported. Of vegetables 1,898 packages were sent to Broken Hill. During the same period 4,317 cases of fruit were inspected for interstate and oversea export. These consisted almost exclusively of apples, oranges, and lemons. Sixty-eight parcels of plants were admitted, and 12 parcels detained or destroyed owing to not being accompanied by the necessary declaration.

DEPARTMENT OF AGRICULTURE.

REMOVAL OF OFFICES.

The Offices of the Department of Agriculture are now situated in the Western Wing of the Jubilee Exhibition Building, North Terrace, Adelaide.

Members of the Agricultural Bureau are invited when in town to call at the Office. The Library of Agricultural Literature possessed by the Department can be consulted by anyone desirous of doing so during ordinary office hours.

ROSEWORTHY AGRICULTURAL COLLEGE EXPERIMENTAL FARM.

INTRODUCTORY.

BY ARTHUR J. PERKINS, SECRETARY FOR AGRICULTURE.

In our August, 1902, issue I commented at some length on the Roseworthy Experimental Farm accounts for the season 1901-02. A detailed statement of the accounts for 1902-03, accompanied by remarks of the Principal of the College (Professor J. D. Towar), will be found below. The yearly publication of these accounts should, in my opinion, fulfil a double purpose—in the first place, it should serve to set before the public the financial returns from a portion of [illegible] territory handed over in trust to the college authorities; in the second, it should enable the farming community to judge from carefully recorded data of the profitableness or unprofitableness of various farming operations, of which they may possess no personal experience.

That the first purpose is well met a glance at the figures will readily demonstrate; as to the second there may exist differences of opinion. It is to be feared that the great advantage in the business of life of rationally kept books is too often overlooked by those whose occupation is mainly agricultural. The admission that probably scores of our most successful farmers are quite innocent of any knowledge of bookkeeping, and that expert jugglers of agricultural debits and credits may occasionally be seen floundering through the Insolvency Courts, does not necessarily discount the value of bookkeeping. The former are business men by instinct; the latter are usually either lacking in common sense or stock exchange speculators who have missed their vocation To the average individual, however, who is obliged to reach by method what a few favoured units may occasionally attain by intuition, rationally kept accounts will always point the way to success, if they cannot compel him to follow it. And it is in this sense that I assume that a few additional comments in connection with the college accounts will not come amiss.

An examination of the balance sheet and profit and loss account shows that the year's transactions closed with what may provisionally be called a gross profit of £443 7/6. In view of the comparative failure of the college crops which, by the way, were seeded before Professor Towar's advent to the State —this result is certainly not unsatisfactory. It is, of course, largely to be accounted for by the high prices of ordinary farm produce that obtained during the past season During the season immediately preceding the one under consideration the corresponding profit (after deduction of nine months' salary paid to farm foreman and farm blacksmith in 1902-3) was represented by £1,134 3/6. This season was on the college farm characterised by fair crops, and prices for produce slightly above those that had obtained during preceding years.

From the point of view of the taxpayer the statement of the existence of a profit as shown in the published accounts is all that need be looked for from the point of view of the farmer, who would compare his own results with those obtained at Roseworthy, some further explanatory notes as to the nature of the profit are, no doubt, necessary. Roughly speaking, the various transactions of the year (receipts and expenditure) are relegated to various accounts; in March stock is taken, and the accounts balanced, the difference betwixt those showing profit and those showing a loss, determines the extent of the profit made on the year's transactions. Up to this point there need be no difference betwixt a farmer's accounts and those under consideration The college farm is largely worked by student labour—should the latter be made to appear in the accounts or not? Professor Lowrie decided long ago that this could not be done; and with this view I entirely coincide Students have to be taught their work, and students have to be supervised. What this actually means none excepting those who have had to deal with such matters can form any idea. The position taken up in the past has been that student labour could only be looked upon as balancing this cost of supervision and the losses that are inseparable from this special mode of working. Labour, however, is very far from being represented by nil on the college accounts, under transactions a sum of £558 0/8 is set against this heading. In estimating the net profit to this sum should be added three months' salary paid to farm foreman and blacksmith respectively, but not shown in the accounts In this sense labour and supervision would have received £020 10/8 There are few farms of 1,200 acres in a mallee district that pay more than this sum. I think, therefore, that we are entitled to look upon what is actually paid in wages as more than equivalent to what would be paid under ordinary conditions by a farmer on a farm of similar dimensions, particularly when it is borne in mind that some portion of the work is experimental, and consequently not only unusually costly, but extremely problematic as to its financial returns.

Nevertheless, the profit shown is a gross profit, and we have yet to derive from it the actually net profit. First, from the £433 7/6 must be deducted three months' salary to the farm foreman and blacksmith, as previously they had been paid out of special lines on the estimates. This brings it down to £380 17/6. From this sum would have to be deducted the rental value of the land—1,230 acres at 4/- = £246. Our net profit is therefore represented by £134 17/6, as against £825 13/6 in 1901-2. It is with some satisfaction that we may reflect that during the current season the Roseworthy district has been exceptionally favoured, and there is every reason to anticipate that the net profit in 1903-04 will exceed that of 1901-02.

So much for the general transactions on the farm, the final results of which are faithfully portrayed in the published accounts. But if we wish to push matters further—and no doubt many a farmer would wish to be in a position to do so—we gain no help from the published statements of the accounts. If, for instance, we wish to ascertain to what extent pig raising, dairying, wheat growing, &c., have proved profitable, we are unable to do so, for the simple reason that the balances shown against the various accounts are purely fictitious balances, and in no sense, except in the aggregate, actual profit and loss balances. Stock are not debited with the food they consume, wheat is only credited with what is actually sold and in stock at the end of the year, whilst no attempt is made to separate expenses in connection with the various accounts, the total being massed together under the heading of working expenses. We have here bookkeeping reduced to its simplest expression, so far as its object is to ascertain the mass results of the various farm operations, but as to their individual results we are left absolutely in the dark. A farmer is largely actuated by likes and dislikes, and no doubt the nature of his occupations will always bear the impress of the bent of his mind. And from this point of view he will probably, if he has recourse to bookkeeping at all, rest satisfied with this simplified form I cannot agree, however, that in a public institution in which farming operations are more varied than is usually the case, and in which regular records can readily be kept, that there is any special advantage in adhering to this simplified variant of legitimate bookkeeping. An obvious disadvantage can, in fact, readily be pointed out—assuming that the year's transactions close with a debit balance, in view of the great variety of operations in force, how is it possible to trace back the loss to any one of them without a more exact system of bookkeeping?

I have referred to the yearly publication of these accounts as fulfilling a double purpose The first, so far as rendering accounts of stewardship is concerned, I believe to be faithfully met by the published results; the second, I fear, has not yet risen above a pious aspiration

Financial Statement for Season 1902-3.

By J. D. Towar, Principal Agricultural College.

In the following pages will be found the financial statement of the Agricultural College Farm for the year ending March 31, 1903:—

Comparing the statement with the one made one year ago, it will be noticed that the net capital has increased by £143 7/6, which may be regarded as the gross profit for the year The net profit would be determined by deducting the rental value of the farm from this balance.

While the statement with the accompanying itemized transactions is self-explanatory, I wish briefly to call attention to the few points in which this report varies from the one of last year.

The value of stock is less than last year. This may be accounted for by three causes:-

1 General depreciation on implements and sundries.
2. Several articles which have no practical value were dropped from the inventory.
3. The very light harvest.

The farming implements have been increased by the purchase of a weighbridge, £60, and a multifurrow plough, £20.

The increase in the valuation of cattle is due to growth of young stock, and the fact that only £22 has been received this year from the sale of cattle, as compared with £108 last year.

Owing to the high price of grain the number of pigs has been kept down throughout the year, and several of the old breeding sows have been sold. The result is that nearly as much money was received for pigs, but the actual value of the swine herd at the time of taking the inventory is less by £80. A herd of young breeding sows is being formed, and it is only a matter of a few months until the value of the herd will grow to its original size.

The value of the sheep remains about the same. Some twenty ewes died early in the year, and a few culls have been used for rations; the increase in the flock practically compensating for these losses, leaves the valuation but slightly changed.

The expense of repairing the blacksmith's shop and the silo was borne by the department, as was also the timber, brick, lime, cement, and galvanised iron.

The labour item of £554 includes £187 10/ of salary paid the farm mechanic and the farm foreman, which was formerly paid from College salaries, besides three regular men, student labour during vacations, mechanics employed on weighbridge and silo, and the expense of grubbing 10 acres of land.

All the work of chaffing and hauling to Roseworthy 170 tons of hay sold the previous year was done during the present year, and the carriage on this hay, amounting to £34, was paid out of this year's moneys.

After all that may be said, there is only one direct and indirect reason that can be given for the existing differences in the final results, and that is the shortage of the products of the land. Favourable prices have prevailed; indeed some of the products have been sold at an advance on the invoiced price, but in spite of this a shortage exists which a more favourable season and better crops would undoubtedly have avoided.

Balance-sheet. March 31, 1903.

Liabilities	£	s.	d.	Assets	£	s.	d.	£	s.	d.
Debts payable	27	6	4	Debts receivable				445	18	10
Balance (capital)	5,670	18	9	Value of stock, &c.—						
				Horses	£363	0	0			
				Cattle	192	0	0			
				Pigs	126	2	0			
				Sheep..	174	6	0			
				Implements.	898	5	0			
				Bags	4	17	11			
				Sundries.. ..	323	15	2			
				Wheat	374	0	8			
				Seeds (various)	11	18	0			
				Hay	840	0	0			
				Wool..	105	15	9			
				Manure	110	16	0			
				Harness	56	18	0			
				Fencing—						
				Erected ..	170	0	0			
				Material ..	94	5	2			
				Water service—						
				Material ..	57	4	8			
								3,900	19	4
				Treasury balance				1,351	6	11
	5,698	5	1					5,698	5	1

Profit and Loss Account. March 31, 1903.

	£	s.	d		£	s.	d
To working expenses	797	15	1	By hay and chaff a/c	607	5	2
Petty expenses	1	10	4	Wheat a/c	287	1	11
Manure a/c	145	7	6	Pigs a/c	249	2	2
Implements a/c	122	14	[illegible]	Sheep a/c	238	13	7
Sundries a/c	102	19	1	Cattle a/c..	201	6	0
Seeds (various) a/c	53	11	5	Straw a/c	77	9	6
Bags a/c	22	5	6	Horse a/c	53	17	6
Harness a/c	17	9	9				
Permanent improvements	7	15	1				
Balance	443	7	6				
	1,714	15	10		1,714	15	10

Capital Account.

	£	s.	d.		£	s.	d.
Net capital, 1/4/02	5,227	11	3	Net capital, 31/3/03	5,670	18	9
Balance	443	7	6				
	5,670	18	9		5,670	18	9

Transactions—April 1, 1902, to March 31, 1903.

Sales	£	s	d.	Purchases	£	s.	d.
Hay and chaff	638	18	5	Implements and parts ..	100	16	7
Wheat	332	7	10	Manure	121	9	10
Straw	190	18	8	Water pipes, fittings, and hose	57	4	8
Pigs	351	8	11	Weighbridge	40	0	0
Lambs (prizes, £0 3/) ..	54	9	5	Harness and repairs ..	28	5	1
Cattle	22	5	0	Fencing material..	47	17	1
Dairy produce..	119	1	1	Binder twine..	26	13	6
Horses	66	10	0	Binding wire..	19	6	10
Sheepskins	137	15	6	Timber..	23	14	8
Sundries..	8	10	11	Seeds and plants	23	6	2
				Blacksmith's tools and ironmongery	16	8	8
				Bricks, lime, cement ..	15	18	0
				Travelling expenses of farm servants	11	3	1
				Camera and accessories	11	1	9
				Farm and garden tools	11	18	9
				Kerosine	7	19	9
				Lubricating oils	8	9	0
				Milk-testing apparatus	9	7	11
				Galvanized iron and washers	6	10	9
				Public stores—charges..	8	7	5
				Pig (boar) and freight ..	6	6	6
				Insurance premium (hay)	6	12	1
				Sundries	5	9	11
				Sacks	5	0	3
				Rope	3	4	2
				Bran	4	4	8
				Stallion fees	3	12	6
				Coal	2	5	8
				Sheep	24	4	0
				Show fees and subscription	1	16	0
				Petty expenses	1	2	11
				Paints	1	1	0
				Labour	558	0	8
				Carriage	125	0	11
					1,338	15	9
				Balance	583	10	0
	1,922	5	9		1,922	5	9

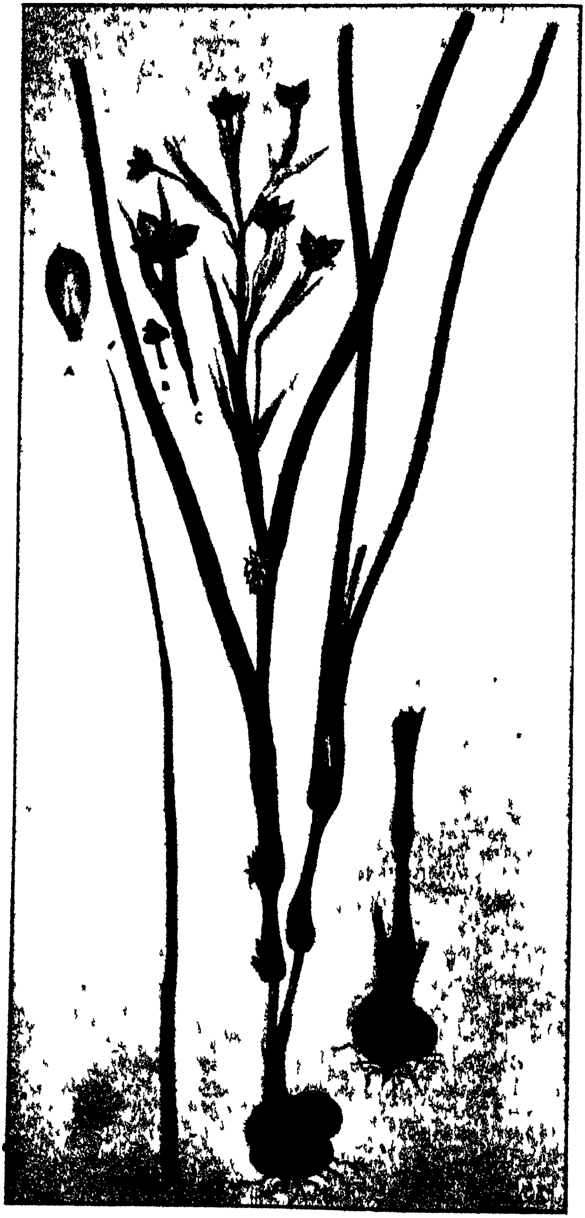
CAPE TULIP—HOMERIA SPECIES.

By W. L. Summers.

Early in the history of the Agricultural Bureau, about the beginning of 1889, I believe, attention was directed to the presence of an imported bulbous plant near Myponga, where it was reputed to have caused the death of some cattle. This plant was identified by the late Dr. Schomburgk as Bobartia aurantiaca, a native of Cape Colony, and where it bore a well-proved reputation of being poisonous to stock. Later on the name was given by the late Baron von Mueller as Homeria sp., probably H. lineata. Subsequently specimens were submitted from Victoria to the Government Botanist, Cape Colony, who reported to Baron von Mueller, in connection with reputed cases of cattle poisoning at Pascoe Vale, near Melbourne, in 1892, that the plant was the red flowered variety of Homeria collina (the ordinary form of which bears flowers of a sulphur yellow colour), and that it was undoubtedly poisonous. In 1893 a bulletin was issued by the Victorian Agricultural Department concerning the poisonous nature of this weed, leaving but little doubt that it was the agent responsible for the deaths of nearly 20 head of cattle in one paddock in the course of a few days. Experiments in feeding the plant to rabbits resulted in death within two days Experiments with cows also demonstrated the poisonous character of the plant. Members of the local defence forces, who took part in the late South African war, state that many army horses died from poisoning caused by eating this weed.

In South Australia the spread of the Cape tulip was viewed with considerable alarm by the Agricultural Bureau, and on several occasions recommendations were made that it should be declared a noxious weed, and its destruction enforced before it covered too wide an area of country. Of late years we have received specimens from various parts of the country, mainly south of Adelaide, but also from as far north as Clare district. Around Adelaide it has spread to an alarming extent, and there can be no question but that the grazing value of the land in many places has seriously deteriorated in consequence. Recently a considerable number of losses of dairy cows has occurred near Adelaide, and the following report has been furnished to the Central Board of Health, by Mr. J M. Morris, M.R C V S.:-

"Early on Wednesday morning, July 15, Mr. McKenna, a dairyman, from Redfern, Mitcham, asked me to examine his cattle, as two of his cows had died and a number of the others were ill and unable to stand On visiting the place I gathered the following particulars: Twenty-four cattle of all ages, belonging to three persons were sent out in the morning to graze on the roadways of the district. They were in charge of some boys, who allowed them to wander as far as Hilton In the afternoon some of the cattle appeared ill, and two of Mr. McKenna's cows died By next morning 16 of the remaining cattle were ill. The first symptoms of illness noticed by the owners were restlessness, occasional slight cerebral excitement, and frequent passage of urine and faeces. Emesis occurred in one cow, accompanied by diarrhoea Following this stage of excitement the animals were disinclined to move, and locomotion became difficult, the animals gradually losing the power of their hind extremities My examination of the cattle was made about 20 hours after the first symptoms of illness were noticed. The affected ones were in a natural recumbent position, rumination suspended, breathing and temperature slightly under normal, pulse very much accelerated. Motor paralysis of limbs, the hind legs being most affected The voluntary and involuntary muscles of the alimentary track seemed to be involved, deglutition being difficult, so much so that some of the animals were choked when being drenched. Peristalsis was very slight or arrested, and the anal and vesical sphincters were relaxed Postmortem examination was superficial and incomplete, as the animals were cut up before my arrival. The lesions seemed to be confined to the mucous membranes of the stomachs, desquamation having taken place in the rumen, reticulum, and omasum. The internal linings of the abomasum and anterior portions of the small intestines were congested. Other regions seemed natural, and the blood coagulated In the rumen were found pieces of the tough linear leaves of the Cape tulip. Between Keswick and Hilton the Homeria collina, or Cape tulip, was found growing very luxuriantly, some of the paddocks being completely occupied with it. The people in the locality say their



HOMERIA COLLINA, VAR MINIATA (CAPE TULIP) About one third natural size.

animals will not eat the plant, but it is not uncommon for animals when hungry and unaccustomed with the weed to consume some of it, usually with a fatal result. Children are said to eat parts of the bulbs without any ill effects. That the plant is the cause of death there is no doubt, but whether it is due to a poisonous alkaloid is doubtful. From an experiment with guinea pigs, I am of opinion that the plant has toxic properties, as an extract made from the leaves, and injected subcutaneously into a guinea pig caused symptoms similar to that in the cattle, and death of the pig in three hours. Nine of the 18 affected animals died, and subsequent to this another man lost seven bullocks in the same locality."

Conversing some years ago with a gentleman from the Yankalilla district, I was informed that he had known this plant in his college days, and that there was a considerable area in and around the school grounds infested with the weed, but he never heard of any losses of stock grazing thereon. His later experience was that it was only strange cattle that suffered, and this, it may be noted, is almost the general experience. Stock grazing on the land apparently find out early that the plant is unsuitable for food, and avoid it, whereas strange stock turned into infected paddocks partake to a considerable extent of the very promising looking vegetation, with the result stated in Mr. Morris's report.

I am convinced from careful observation over several years, and from some little experience in my own flower garden, that the eradication of the Homeria will be attended with many difficulties. The only practicable remedy will, I believe, be frequent cultivation of the land; in fact, putting the affected pastures under crop for a number of years. We have evidence of the necessity for continuous cultivation in connection with two paddocks near Keswick. One of these was broken up and cropped a few years ago, but is now very badly infested, the growth being, if anything, so I am informed, even more luxuriant than on the surrounding fields. The other paddock is separated by a road, and is ploughed nearly every year. On this few, if any, plants of Cape tulip are noticeable. At a recent meeting of the Council of Agriculture Mr. Krichauff illustrated the difficulty of eradicating this plant when he informed the members that although he had made vigorous efforts he had not been able to get rid of it entirely from his flower garden.

Description of Weed.

The illustration shown on page 72 is reproduced from the Victorian bulletin previously referred to, and shows the plant at about one-third natural size. When mature, the flowering stalk will sometimes reach a height of 30 in. to 36 in., and the lower leaves 20 in. to 24 in. in length and ½ in. to ¾ in. broad Usually the growth is not so strong as this, and in dry seasons or inferior soil will be considerably less. The long lower leaves are usually procumbent, the bulb is about ¾ in. to 1¼ in. across at the base, and is covered with a dark greyish-brown fibre, beneath which hundreds of small bulbs, or bulbils, are found Similar bulbils are also found on the stem. The character of the flower stalk and the flowers is well depicted in our illustration, though many plants carry only two or three flowers. They are about 1 in. to 1½ in across, orange yellow in colour at the tip and fading off towards the centre; at the base the petal is yellow, with some faint green markings. The petals are very delicate and quickly fade.

From one bulb alone I counted over 500 bulbils, which germinate very readily, and at this season of the year can be found literally in thousands amongst and around every clump of the weed

ADULTERATED FLOWERS OF SULPHUR.

During the past month a fruitgrower from near Belair brought to the office of the Department of Agriculture two samples of flowers of sulphur for examination. One sample was typical flowers of sulphur, being of good yellow colour and fairly fine grinding. The other sample, however, was very different, being of greenish yellow tint, and badly ground, besides containing large lumps of a soft white rock. The purchaser stated that he bought six bags of sulphur off a prominent dealer in the East-End Market, and that one only contained the good article, the other five being more or less adulterated. Towards the middle of one bag he came across a number of these lumps, some of which were 3 in. or 4 in. across, and an inch or more in thickness; altogether in this bag he found about 12 lb. of this material. In view of the importance of the question to vinegrowers and fruitgrowers, who use large quantities for sulphuring their vines for oidium, and strawberries, &c., for mildew and red spider, the sample left at the office was sent to the School of Mines for analysis. After sifting out the coarser material, the rest of the sample was tested, and found to contain only 73.3 per cent. of sulphur. Good commercial flowers of sulphur should not contain more than 3 per cent. or 4 per cent. of impurity; this sample, after removing a lot of the impurity, shows 26.7 per cent. of adulteration. The strangest part of the whole affair is that the coarse material on being tested proved to be crude phosphate rock. Although this would doubtless cost only about one-fourth the price of rock sulphur, or even less, one fails to understand why the manufacturer did not seek some cheaper adulterant. It is also surprising that he should not even have troubled to grind up the foreign substance with the sulphur.

Purchasers of sulphur will easily see that, with from 30 per cent. to 35 per cent. of foreign matter in it, this particular lot could be sold for a few shillings per cwt. less than pure sulphur, and still leave a large margin of profit to the parties responsible for the fraud. Fruitgrowers and others using flowers of sulphur should be careful to buy none but well ground sulphur of a good yellow colour, and not be led away by a small reduction in price to purchase impure mixtures.

NOTES FOR DAIRY FARMERS.

By G. S. Thomson, F.R.S.E., Government Dairy Instructor.

RAPE FOR MILKING STOCK.

The cultivation of rape for milking stock has not been sufficiently commended to encourage farmers to include it among the crops grown for the dairy herd. This is partly attributed to the very common belief that the plants possess to a marked degree the property of imparting to milk a disagreeable taste, and there is no reason, however, to doubt the experience of farmers that feeding cows on liberal supplies of rape is mainly the cause of the trouble. On farms where the crop has been successfully cultivated the cows are not allowed to graze on the plants too long for the first few days, until they have accustomed themselves to the qualities of the rape and with no bad effects in the milk yield. Even then the experienced farmer does not put his herd to pasture on the crop for many hours at a time, preferring to change them daily to other forage paddocks. Rape, when injudiciously fed, is not the only fodder which gives a strong flavour to milk, for the cabbage, turnips, and silage are also more or less troublesome under such conditions. Beyond its milk- and health-producing properties in the cow, rape has other features which commend it to the dairy farmer by improving the productiveness of the soil. After stock have done ample justice to the crop it is customary to plough it in to add to the plant food and improve the texture of the land. Further, the droppings of the cows fall on the soil at a season of the year when the manurial constituents are retained.

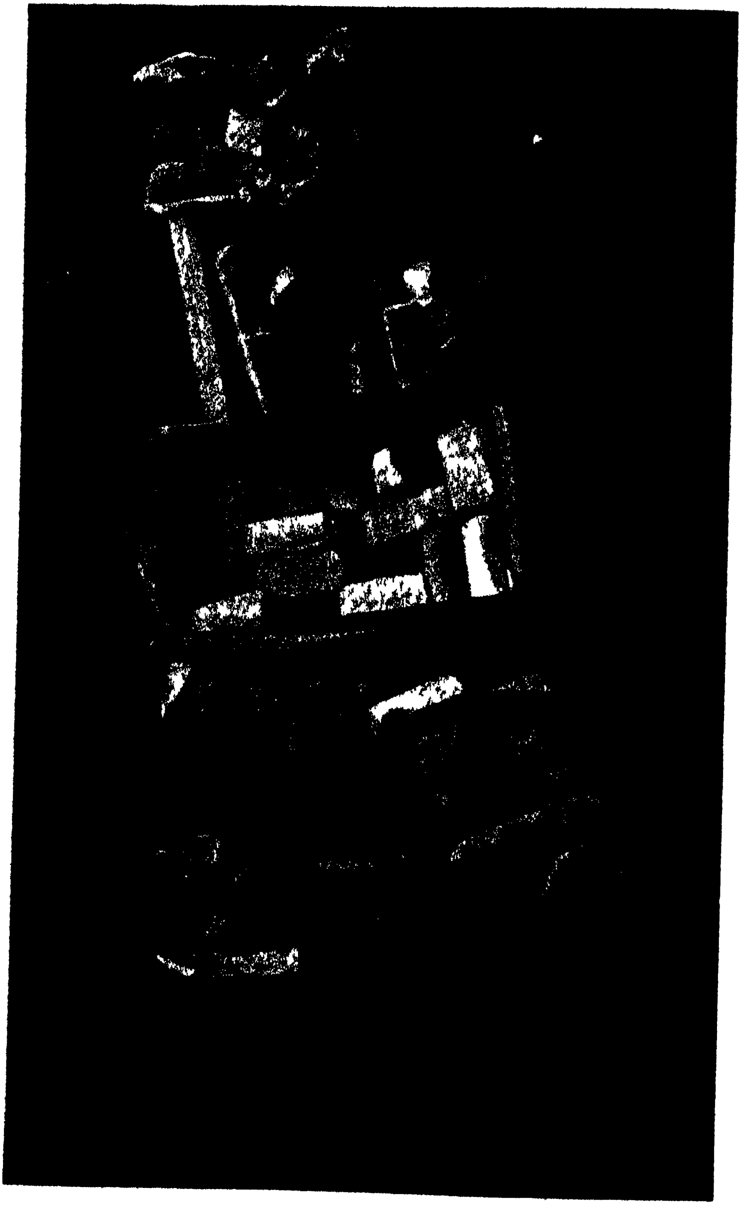
Rape will grow on almost any kind of soil, but it prefers one rich in organic matter and plant food. Land must be well cultivated, and a fine tilth prepared, otherwise seed would be lost. Germination is usually rapid and successful, but old seed should not be sown. The varieties principally grown in the old country are the Dunlop and Giant, but in Australia, Canada, and other countries the Dwarf Essex has given splendid yields and has proved the best drought-resisting variety. When broadcasted from four to six pounds per acre is sown, according to the quality of the soil, climate, and purpose of cultivation. Less seed is required when a strong growth in the plant is aimed at. For cutting purposes heavier seeding is desirable to secure a closer crop. Where this system is practised it is recommended to cut the rape from four to five inches from the ground to ensure a continuation of growth. With care and conditions favourable two or three cuttings may be gathered. Rape is most nutritious when cut young, and as the plant is a biennial its growing propensities are strong for the first few months. Drilling in the seed is not commonly done, but it has the following advantages over broadcasting: —Less seed is required, the leaves grow vigorously, are larger and stronger, less damage follows from stock treading down the plants, and cultivation between the rows conserves moisture and adds to the life of the crop in dry weather.

Rape is not suitable for silage owing to its high percentage of water and soft consistency of the leaves. Like clover, lucerne, cabbages, and sorghum, and especially when the plants are wet, rape causes hoven, or bloat, in stock.

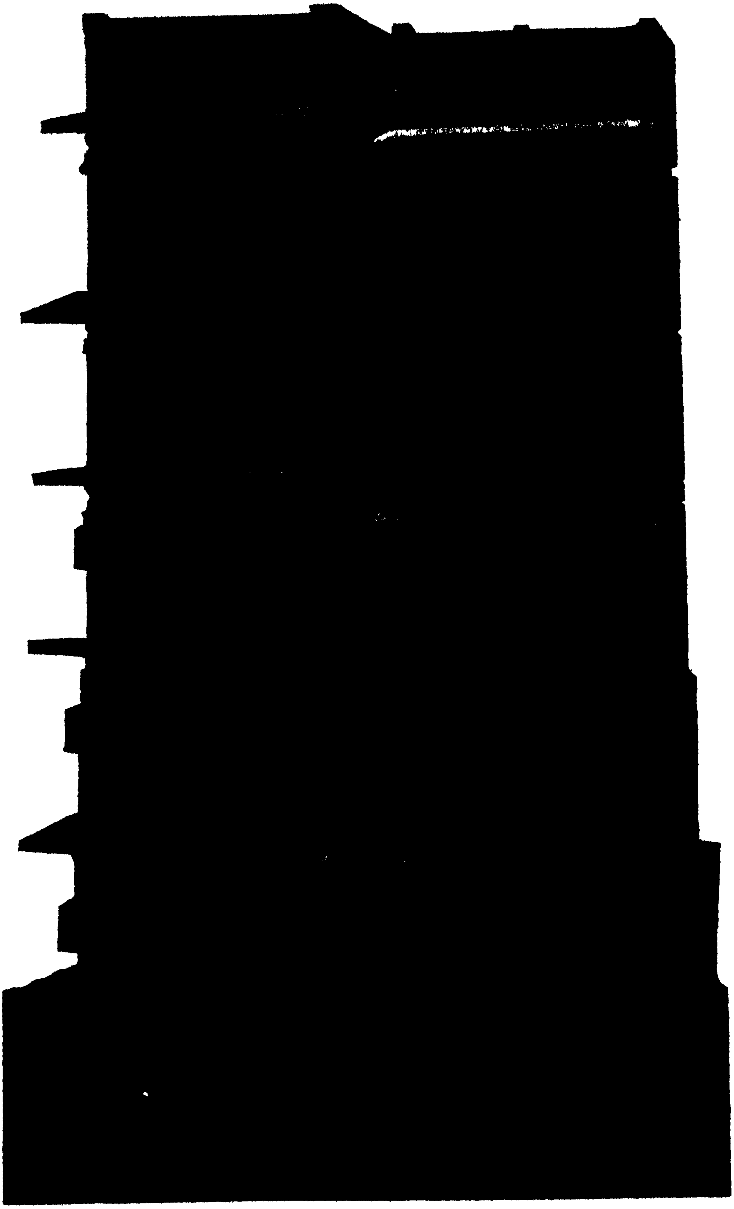
COMPOSITION OF FOODS.

The following table from McConnell's Agricultural Notebook gives the composition of foods in water, digestible albumenoids, fats, sugar constituents, and organic matter. All those of importance to the dairy farmer are included in the list, and by a perusal of the analyses the quality of the different ones will be at once apparent:—

—	Percentages of Water.	Digestible Matter.			
		Albumen.	Fats.	Carbo-hydrates.	Organic matter.
Root crops:—					
Mangel leaves	90.5	1.2	0.2	4.0	8.7
Mangel roots	88.0	1.1	0.1	9.1	11.2
Swedish turnip bulb	89.4	1.3	0.1	6.3	10.0
Yellow turnip bulb	90.5	—	—	—	8.9
Potatoes	75.0	2.1	0.3	20.6	24.1
Carrot roots	85.0	1.4	0.2	10.8	14.1
Leguminous crops:—					
Lucerne forage	74.0	3.2	0.3	9.1	24.0
Lucerne hay	16.5	12.3	0.9	31.4	76.6
Peas forage	81.5	2.2	0.3	7.4	17.0
Peas straw	16.0	2.9	0.5	33.4	70.5
Tare or vetch	82.0	2.5	0.3	6.7	16.2
Sainfoin forage	81.4	3.0	0.5	7.9	17.4
Sainfoin hay	16.7	7.6	1.4	35.8	77.1
Meals and cakes:—					
Cocoanut	12.7	17.1	8.1	30.3	82.2
Linseed	11.5	23.8	8.9	29.0	80.6
Pea meal	11.4	20.9	2.8	55.4	85.1
Sunflower cake	10.8	27.9	8.1	25.1	83.5
Wheat bran (coarse)	13.6	10.6	2.4	44.4	80.8
Wheat bran (fine)	12.1	11.0	2.9	47.2	83.8
Wheat middlings (fine pollard)	12.5	—	—	—	85.6
Wheat sharps (coarse pollard)	12.8	—	—	—	82.6
Other crops:—					
Maize forage	82.2	0.8	0.2	9.9	14.7
Pumpkin	89.1	0.4	0.1	5.8	9.9
Melon (cattle)	91.4	0.9	—	4.7	7.9
Rape	87.0	2.0	0.4	4.8	13.4
Sorghum	77.8	1.6	0.3	11.9	21.6
Cabbage (white)	89.0	1.1	0.2	6.6	9.8
Cabbage stalks	82.0	0.8	0.2	11.5	16.1
Cabbage, Drumhead (outer leaves)	91.0	—	—	—	6.8
Cabbage, Drumhead (inner leaves)	89.4	—	—	—	10.8



Condition of some Boxes of Farmers' Butter when opened at Auction Mar



Boxes of Factory Butter as received at City Auction Mart.

PACKING BUTTER FOR SALE.

The appearance of packages of dairy produce leaves much to be desired. A glance at the shop windows and a visit to the city salerooms provide daily illustrations of marked carelessness in the get up of butter. That the ancient practices of "beautifying" and protecting rolls of butter have not faded in the face of progress shows how tenaciously some people cling to customs too crude, unprofitable, and objectionable for repetition in our markets of to-day. Fashions, old and new, must go to the wall to be replaced by what is productive of greater success, being in accordance with the keeping properties and good appearance of the product. We agree that butter and cheese will not increase in quality by a special effort of the dairyman to improve its outward attractions, but it is beyond denial that a consignment of choice butter, whether from farm or factory, will encourage a greater demand, and call for a better price if tastefully displayed. And this much-desired reform can be secured at very little trouble by the practice of neatness and a little skill in packing Our factory system shows an example of tidiness that ought to be followed as far as practicable by every manufacturer of butter. The boxes are strong, neat, and durable: pounds of butter are free from ridges, smooth, and square; paper is of good quality, evenly put on; and altogether the finish commands attention and admiration. To open one of these boxes upon arrival in the city after a long journey and see the produce beautifully arranged on shelves is sufficient guarantee of the value of care and neatness. Contrast with the box of defective design, filled with unshapely rolls or squares of butter lying in careless confusion, without paper, perhaps, or roughly covered with a quality hurtful to sale and annoying to the consumer, who is confronted with difficulty in separating the tissue-like pieces from the butter. The annual loss to dairy farmers through bad packing of butter must be heavy, and the increased injury occasioned by summer heat is a most serious reflection upon our methods.

The accompanying illustrations show the appearance of boxes of butter as received for sale in the city.

THE WATER SUPPLY AND BUTTER MAKING.

There is good cause to believe that impurities in the water supply at our farms and factories are responsible for injurious flavours in butter and cheese. We acknowledge that impure water for milking stock has a reducing influence on the keeping properties of milk, and the good flavour is not so prominent from the same objection. With this occurrence in the animal, and which is not brought about by the action of germ life in the body of the cow, but by the product of bacteria in the water at the time of drinking, we are confronted with a problem of vast importance to the manufacturer of dairy produce. In the making of butter we use large quantities of water for washing the grains, and when this process is properly executed every particle of butter is brought into contact with the water. Assuming the supply to be of low purity, what happens? Objectionable organisms and flavours are distributed throughout the body of butter to the great detriment of flavour in the product.

From examinations of water supplies used in butter making, conducted by me during the past five years, there is reason for giving prominence to this subject. In one month over 30 samples were kept in corked sterilized bottles, and at the close of from five to 15 days strong odours were emitted when the corks were drawn. All the samples were free from smell at the time of collecting, but a chemical and bacteriological examination detected the extent of the impurities. This points to what is likely to take place in butter after manufacture where food for germ life is supplied. There are other sources of danger which can be more readily overcome without incurring cost. I refer to the cleansing of milk utensils. Where boiling water and soda is not used in the washing of milk vessels impurities are introduced into the milk through a contaminated water supply.

As every one knows, fermentation is very rapid in milk, hence the possibilities of taints developing before the milk passes into the hands of the manufacturer. In the washing of separators, which must be conducted after each operation of the machine, cleansing with warm water only is injurious to the keeping properties of the cream, and when the work is carelessly done the quality of butter produced is more seriously affected. Filtering and boiling are the two preventive means at our disposal in the treatment of an impure water supply, and when the former is employed in butter making and the latter never omitted under any circumstances in the cleansing of milk and cream the quality of produce would be enhanced

Plate 1.—Boiled Water. Plate 2.—Filtered Water

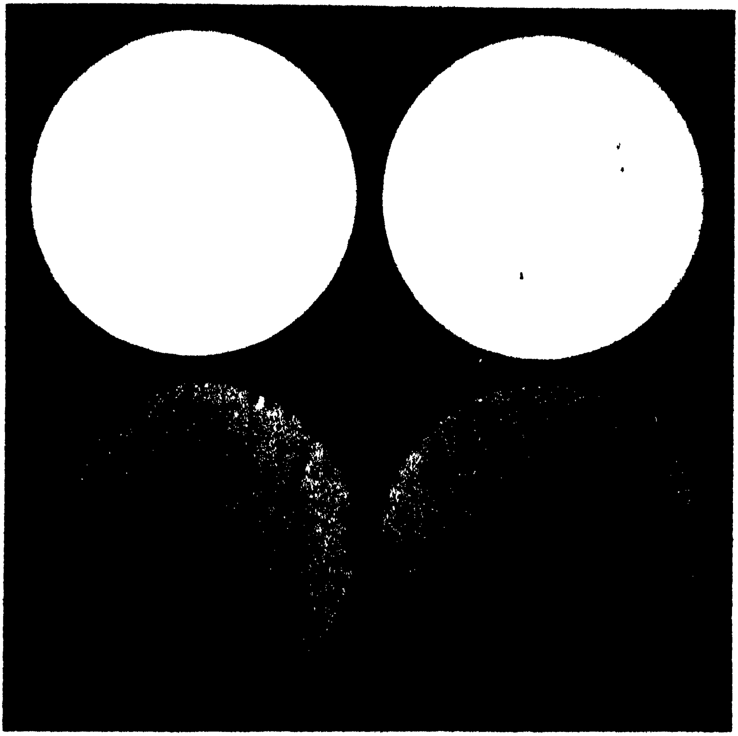


Plate 3 —Untreated Water Plate 4.—Scalded Water.

The illustrations show the sterile properties of filtered and boiled water, while the untreated supply is productive of much organic life. These plates were prepared after inoculating liquid germ food with one drop of water from each supply, afterwards pouring the contents of the four tubes into glass dishes to solidify into firm jelly. The colonies of germs in plates 3 and 4 were photographed after the dishes had been kept for 48 hours. Plates 1 and 2 show no signs of bacteria.

RUGGING COWS.

Tests in rugging cows have been conducted at the Agricultural College during the past six weeks. Half a dozen cows were selected, four of which were advanced in lactation. During the first few weeks the quantity of milk gradually increased; during the third week of the experiment the yield showed an increase of 15 gallons compared with the week previous to rugging. For the sixth week the fall in the milk yield was only three gallons compared with the average weekly yield for the six cows 14 days before the rugs were put on. This is satisfactory, considering that the test started late in the season, when the cold weather was over, and the cows heavy with calf. In the case of the two cows in normal milking one gave an increase of 26 lb. of milk for the fifth week, while the other reached her best at the end of the third. The percentages of fat were higher in every instance after rugging, and continued throughout the experiment. The tests go to show that rugging increases the percentages of fat and yield of milk, and that cows drying off have their turn of milking extended. As the cold season is now over I would advise dairy farmers in the warmer districts to remove the rugs from their cows and put them away safely for use in time to come; if cold weather should occur the rugs should be put on again

FRAUDS IN SEED-SELLING.

Every few years some enterprising and unscrupulous seedsmen boom the sale of old well-known plants under new and striking names. More often than not fodder seeds are selected for this purpose, and by means of circulars, advertisements, and press notices of a most laudatory character large sales at high rates are effected, to the disappointment and loss of the purchasers It not infrequently happens that our honest seedsmen, led by the published descriptions of the plant, procure and advertise seeds locally, and are afterwards blamed by the purchasers for selling worthless or common seeds at high prices Doubtless a number of such instances can be called to mind, and we would warn agriculturists against the latest dodge in this direction.

During the past two years we have seen most extravagant and laudatory notices of the value of a new and hardy fodder plant. Various more or less picturesque names have been attached to this plant, of which "World's Wonder Forage" and "Penicilaire" may be mentioned. Prices quoted for seed are such as are usually asked for new introductions, and according to American reports large quantities of seed have been sold there at from 1/6 per oz. to 12/6 per lb. It is stated that investigations by the U.S.A. Department of Agriculture revealed the fact that even higher prices had been realised in Germany and elsewhere. As notices of this plant have appeared in Australia of late we feel it necessary to call attention to this matter. The plant so described is neither more nor less than the well-known pearl millet (Penicillaria spicata), seed of which can be purchased locally at from 1/ to 1/3 per lb., so that any one desiring to try it can do so at little cost; without paying high prices for it under a fanciful name.

It may be mentioned that pearl millet and others of the same family are well worthy of attention, both for the forage and for the seed. In New South Wales from 20 to 40 bush. (of 60 lb. weight) per acre have been secured, and as the seed is valuable for feeding purposes, the plant is worthy of the attention of poultry keepers. Seed should be sown at about the same time as sorghum, and where the latter will do well, profitable returns may also be expected from millet

POULTRY NOTES.

By D F. Laurie.

Shows.

These notes will be in print before the agricultural show is held, and I hope the visitors to Adelaide will give the collection of poultry more than a passing glance I attended the general meeting of the Poultry and Kennel Club the other night, and met a number of our principal breeders. In the course of the speeches made by the members of the committee it was refreshing to note the change of tone from what was usual a few years ago. The poultry industry, it was pointed out by several speakers, is looked upon by the Adelaide breeders not as a hobby but as an important business, and our already respectable exports should prove to the most sceptical that no stone should be left unturned in the endeavour to foster it. The success of the shows of this society the last year or two, and particularly the last one, is due to the committee—a different stamp, the commercial man, is well represented; the whole tone is as one would wish, and there is every reason to hope that a marked increase of active members, who care nothing for a few paltry prizes, will enable this worthy society to play an important part in promoting poultry breeding.

Readers will remember that year after year it was my custom to criticise the show—birds and management—and make many suggestions. I am pleased to say that not only have I no cause for further remarks in this direction, but, in addition, I consider the show equal in arrangement and convenience to any in the States.

Unfortunately, Mr. Creswell will not be able to exhibit the poultry under such favourable conditions as at the Poultry Club's show; still there will probably be an excellent display, though as the breeding season is well advanced the birds will not appear to such advantage as at the earlier show. The September show is really too late in the year for our climatic conditions—it is in the middle of the breeding season, and our breeders have not yet reached the stage of keeping breeding and exhibition stock separate.

The main feature of present-day poultry shows is the wonderful advance of the utility breeds and the almost total absence of the oldtime fancy fowls. Visitors now find very few Brahmas, Cochins, and Spanish, while Hamburghs are a vanishing although useful breed, and Polands will probably have no representative in the near future. Wyandottes are the birds of the day, and were practically unknown here a dozen years ago. The Orpington, a more recent breed, is also in very strong force. The Indian game still holds a very strong place, though perhaps before long that excellent laying breed, the old English Game, the champion table bird, will prove a more valuable bird especially to farmers—it is such a grand forager and quick grower. Among the laying section visitors will see a most wonderful improvement in Minorcas and Leghorns—a few years ago a decent Leghorn was quite rare at our shows, now there are numerous splendid specimens of the various colours. Andalusians are again on the up grade, and the new Campine—the modern development of the old "Dutch everyday layer" of our forefathers—makes quite a show on its own account.

Incubators and the various accessories to poultry breeding will be numerous, and the progressive visitor will see much to interest him in this section. Many visitors are somewhat diffident in asking for information from breeders and others. I may say that all the poultry breeders and exhibitors in this section of the show will be only too glad to give any help in these matters.

THE BREEDING SEASON.

From what I hear a great many people are not breeding so freely in the country this year on account of the present high prices of food It should be remembered that poultry feed generally will be very much cheaper in the course of a few months. Young birds will not eat so much, and their selling price, owing to scarcity, will be higher than usual this and next year. With the prospect of more prosperous years in front of us, there should be a big move in poultry breeding. There is always a good market, and the word "glut" is never likely to be in use in this matter.

Earlier hatching should be the rule. There is no doubt that on farms where no eggs are incubated till late in the season a class of hens results which are only spring layers. Whereas, if early batches were also the rule, we should perpetuate those strains which lay at a time when eggs are valuable. This is a point generally overlooked—characteristics are transmitted from parent to progeny in such cases where they are permanent and not recently acquired.

Where egg laying is the main result required, it must be remembered that strain is the important factor, not, of course, forgetting that some breeds are famed as layers while others are not. Set only the eggs of those hens which are known to be good layers, and if these hens are mated with male birds bred from similar good layers, the characteristics will become inherited to a marked extent and a flock with a high average will result. Considerable money is being spent in importing representatives of strains noted for layers, and if this method of breeding be adopted the fecundity of the strain should increase. In America there are flocks averaging over 200 eggs per hen per annum. This has been brought about by careful selection and breeding—line breeding, as a rule.

I lectured on this important subject recently at the School of Mines, and distributed a number of charts illustrating the subject. The importance (and this applies to all stock) of perpetuating a line of valuable blood is very great, and has long been recognised in England and America. During many years I have alluded to the subject and explained it at some length. Briefly it is this:—If you have a sire or dam—bird or beast—and you wish to breed progeny as near to one or the other as possible, scientific line or pedigree breeding shows how this may be done to the greatest advantage without inbreeding to any extent. By this method in a few generations you can breed progeny having 15-16ths of the blood of the parent you wish to perpetuate. It is found that economic qualities, such as egg yield in fowls, butter in cows, wool in sheep, &c., can be greatly influenced in this manner. Wherever new blood is introduced it should be by the female line, because, should the progeny prove unsatisfactory, it can easily be eliminated; whereas, if a new sire is introduced, there will be the progeny of numerous females, which will be of little value. Characteristics once acquired may be readily fixed by line breeding, and it has been proved beyond all doubt that the injudicious introduction of untried blood may spoil years of trouble and work. It would be difficult to publish this chart in the form I have given it, but I have a few on hand which readers are welcome to if they send a stamped envelope.

PRESERVING EGGS

When eggs are cheap the modern breeder should preserve as many as he can in a solution of waterglass. This is very cheap and effective, and the trouble involved is slight. All eggs should be quite fresh and clean. The solution can be from 1 in 10 to 1 in 20, and kerosine tins or clean casks will answer very well. This method is far better than the old limewater business. In due time the eggs are taken out washed, and carefully dried, and then tested with a strong light. If the eggs were fresh when put in and kept in a cool place they will come out equal to fresh after several months.

WHITE INDIAN RUNNER DUCKS

Mr. W. Cook, an English breeder, who paid Australia a visit a year or two since, announces that he has succeeded in breeding a pure Indian Runner with white plumage. No cross with a white bird, it is asserted, has been resorted to. If these statements are correct the new breed should enjoy considerable popularity. Possibly my friend Mr. Pitman, our principal Indian Runner duck breeder, may give the new breed some consideration.

EXPORT OF EGGS.

The information as to values of our exports of poultry and eggs published in this Journal has proved attractive, and several contemporaries have annexed it. Some particulars were placarded at the Dog and Poultry Show recently, and The Journal was not given its due. As may be remembered, these figures were courteously supplied by the Collector of Customs in response to my request—last year's figures were thus obtained by the editor of The Journal of Agriculture and incorporated in my pamphlet. It is as well to be explicit in these days of literary piracy.

THE POULTRY TICK.

The Adelaide breeders are at last awakening to the importance of the subject. At the recent Poultry Club meeting the subject was discussed; and several breeders related their unhappy experiences. I am still of opinion, however much I may think of the Victorian action, that our first action should be to take very decided steps to eradicate the pest. It can be done easily, that is, by people of ordinary intelligence. Those who talk twaddle about spontaneous generation are not likely to prove efficient instructors for the public. The tick cannot fly, and he is slow in moving, and dies quietly when properly dealt with in the manner I have so often suggested.

The Egg-laying Competition.

I anticipate that the committee will arrange matters so that visitors to the show will be able to view the birds at Magill during show week. The competition has attracted a good deal of attention, and much credit is due to the energetic gentlemen who initiated the scheme. Anything which helps to arouse public interest in the poultry industry deserves well of us. Those who are prone to pass judgment must remember that while the birds are fed with more regularity and judgment and on more suitable food than is the case with the average breeder's fowls, still they are housed in a cold, bleak position, and have not the warm barns and haystacks available for many country fowls. When the final results are to hand the information will be interesting, but, of course, as regards many breeds inconclusive.

COUNCIL OF AGRICULTURE.

The monthly meeting of the Council of Agriculture was held on Wednesday, August 26, all the members but Messrs. Yelland, Pridmore, and Krichauff being present.

Discussion took place on motion moved by Mr. Molineux that "in the opinion of the Council it was not desirable that any member should hold the office of Chairman for more than two consecutive years." Votes being equal, the Chairman gave his casting vote against the motion.

The Secretary for Agriculture forwarded report by the Inspector of Fruit on resolution from Lyndoch Branch in favour of the inspection of all plant nurseries and the publication of the inspector's report as to the freedom or otherwise of such nurseries from insects or diseases. Mr. Quinn expressed the opinion that unless all nurseries were inspected at least once a month little good would result, as insects may not be observable at the time of inspection, yet the nursery may be overrun with them a few weeks later. Members unanimously endorsed Mr. Quinn's opinion.

In reply to question, the secretary stated that the sum of £100 had been placed on the Estimates for the purchase of standard works, &c., for the Agriculture College library.

Col. Rowell and Mr. Laffer reported on visit to Mr. J. C. Grasby's Glengyle Orchard, near Balhannah. The main object of the visit was to inspect the system of pruning adopted, which could be described as consisting of an open centre or goblet-shaped tree with a single layer of 12 branches. This shape is secured in three years' pruning, starting with three branches, each of which is subdivided into two the next year; the third year each of the six branches is again divided, giving 12 limbs evenly spaced round the tree; after this, all laterals are suppressed or cut back to form fruitspurs. While the system commended itself to them, the trees under notice were too young and had not been under treatment long enough for them to form a definite opinion as to its value. There were, however, many reasons to support Mr. Grasby's contention that the system was a good one. A maximum amount of bearing surface on a minimum quantity of branches was secured, as all buds can be utilized to form fruitspurs. The trees receive regular treatment which, if properly carried out, gives a perfectly controlled fruiting system, producing regular annual crops. Trees being trained low are easily sprayed, the fruit is easily gathered, winter pruning is practically reduced to shortening in the leaders, while the trees can be planted much closer together than is the usual practice in South Australia. There was no doubt certain varieties lend themselves much better than others to this system. Of these, Sturmer Pippin, Scarlet Nonpariel, Cleopatra, and Esopus Spitzenburg might be mentioned.

The following gentlemen were approved as members of the undermentioned branches:—Lyndoch, Mr. G Schenke; Forster, Messrs. G. and A. Payne and C. Tapsfield; Bowhill, Mr. J. Waters; Saddleworth, Messrs. H. H. Klau, J. Kelly, and T. E. Eckermann; Wilmington, Mr. W. Robertson; Virginia, Mr.

S. Johns; Narracoorte, Messrs. A. Attiwill, B. Cotton, and G. Williams; Brinkworth, Mr. W. G. McAllan; Arthurton, Mr. W. Northey; Clare, Mr. T. Dolan; Amyton, Mr. W. Gum; Reeves Plains, Mr. Winton; Kadina, Mr. P. Roach; Mylor, Mr. E. A. Cheeseman; Cherry Gardens, Mr. E. Matthews; Whyte-Yarcowie, Messrs. J. Makin, J. A. Lock, and E. M. Jenkins; Inkerman, Mr. F. Warner; Port Germein, Mr. F. McHugh; Richman's Creek, Mr. H. R. Kelly; Gladstone, Mr. H. E. McDonald; Ardrossan, Mr. W. Barton; Port Lincoln, Messrs. E. M. Sage and E. Reuter.

Mr. Dawkins reported on visit of the College Committee to Roseworthy. The committee suggested that in view of the fact that many persons not actively engaged in agricultural pursuits have taken advantage of the free railway trip, &c., to the exclusion of farmers, a charge of 2/6 for rail fare should in future be made to visitors on "Farmers' Day." The Secretary for Agriculture intimated that the Hon. Minister had decided to make a charge of 2/. Members endorsed the proposal.

Col. Rowell reported that the Committee of Viticulture and Horticulture had considered the proposed new regulations dealing with the importation of plants, and had recommended that plants be permitted to come by rail in bond, and that the regulation requiring a declaration that the plants were not grown within 50 yards of any vines be excised. In reply to question, the secretary stated that the officers of the department regarded it as necessary that all plants coming from phylloxera infested country should be accompanied by the declaration referred to.

Members accepted invitation of Mr. Marshall to inspect the crops around Wasleys on Tuesday, September 29.

Mr. Miller called attention to reports from officers of the Victorian Department of Agriculture as to frauds practised by some manure vendors in that State. He thought it would be well to ask the Inspector of Fertilisers for a report on what was being done in this State. In reply to question, the Inspector of Fertilisers stated that he published from month to month in The Journal of Agriculture results of analyses of samples of all imported fertilisers, besides those manufactured locally The June issue of this year contained a report on the season's work, and members would see that there was no ground for fear that the manures were not generally up to the guarantees of the vendors.

ROSEWORTHY AGRICULTURAL COLLEGE NOTES.

FARM.

By J. D. Towar, Professor of Agriculture.

The crops on the college farm are in good, healthy condition, though somewhat backward, except the barley, which is very rank and forward. This field was a sea of poppy a year ago; now a heavy crop of barley is smothering the weeds and giving promise of a large yield. We especially invite visitors who last year had occasion to criticise this field to inspect it again on "Farmers' Day," and note how thoroughly it has redeemed itself.

Little comment can be made at present on the rest of the crop. The Island and Flett's are reflecting the good ploughing with the disc plough and the after cultivation they received, and give promise of an abundant harvest. No. 6, devoted entirely to experiments, was sown rather late, but is now making good growth, and there is every reason to hope for interesting results. The unmanured plots in the fertiliser tests are now falling rapidly behind, and already offer abundant proof of the value of artificial manures.

The rape, kale, and peas are in a race for favour as forage crop, with rape apparently in the lead. It was sown May 20 broadcast, while the other crops were drilled; as a result it completely covers the ground. These three crops should be especially attractive to visitors on September 14. Other seedings of rape are being made in the fallows, a portion of each field being sown broadcast and harrowed in, very little attention being paid to the preparation of the soil.

Nearly four acres of lucerne sown on May 13 has grown continually all winter, and is now very promising. We shall mow it in a few days to cut the rank growth of lucerne in places and the few weeds scattered here and there. Unless there is danger that the growth cut will smother the plants we shall not remove it, but let it lie to mulch the ground.

The live stock is in fair condition; lambs, however, are no better than last year. We shall make the usual exhibits of fat lambs at the Adelaide show, with two entries in each class. We shall exhibit one Berkshire sow, 15 months old, one sow, 11 months old, and the Berkshire boar, the latter will be sold at auction on the show grounds. The sows are the progeny of this boar The demand for Berkshire breeding sows has been more than we could supply. There will be a few good pigs for sale on "Farmers' Day."

There is excellent feed in all the fields; 300 sheep were recently purchased, some to fatten and sell, others in store condition to convert into rations, and a few ewes to be added to the college flock for breeding.

The college garden is now giving us a fair supply of winter vegetables Large beds of rhubarb and asparagus have been set out, and in the frames a good supply of tomato plants is growing.

EXPERIMENTAL VINEYARD.

By H. E. Laffer, Superintendent of Vineyard.

The weather during August has been generally fine, with very little rain. The first ploughing of the vineyard and orchard was completed in good time, and the second ploughing is now well forward. Pruning has been completed, and the replanting of the orchard has been finished off. Owing to the lack of soaking rain the land is becoming very hard, making hard work for the teams.

Vines are beginning to burst, and fruit trees are coming into flower. A water service has been put down to supply a piece of ground intended for the raising of nursery stock The last of the manure has been applied to the vines, namely, nitrate of soda. This was put on in preference to sulphate of ammonia this season

A few frosts have been registered, but these were only slight. The total rainfall up to date is 10 71 in., of which only .40 in. has fallen in August

ANTHRAX REGULATIONS.

INTRODUCTION OF BONES, BONEDUST, ETC.

In The Government Gazette of July 30 the following regulations for the purpose of preventing the introduction of anthrax into South Australia were gazetted:—

Regulations.

For the purposes of these regulations "stock" shall mean the whole or any part of the flesh, wool, bones, hair, horns, hoofs, or any portion of the carcass of any stock; "fodder" shall have the meaning as defined in "The Stock Diseases Act, 1888;" "the Commissioner" shall mean the Commissioner of Crown Lands and Immigration for the time being; "inspector" shall mean the inspector as defined in "The Stock Diseases Act, 1888."

1. Stock or fodder, except as otherwise provided, may be landed at Port Adelaide; and not less than 48 hours' notice shall be given to the inspector, in the form A in the schedule hereto, of the intention to land such stock or fodder.

2. No stock or fodder shall be landed from any place beyond the State without the written permit of an inspector in the form B in the schedule hereto.

3. All stock or fodder and all bags and packages which contain or have contained stock or fodder shall, except as otherwise provided, on being landed, be removed to such place within Port Adelaide as the inspector shall direct, or such other port or place as the Commissioner shall approve, and shall be subjected for at least two hours to a moist heat of a temperature of

not less than 250 deg. Fahrenheit, equal to an indicated steam pressure of 30 lb. per square inch.

4. In addition to being landed at Port Adelaide, bones or bonedust may, by special permission of the Commissioner, be landed at any port in the State, or in any city or town situated on the border of the State of South Australia and any other State.

5. Bones or bonedust on being landed or imported shall, in the discretion of the inspector, be subjected to treatment either by a moist heat, as hereinbefore provided, or may be converted into superphosphates under the supervision and direction of such inspector, and the observance and performance, on the part of the owner, agent, or consignee, of such bones or bonedust, of all directions and instructions which the inspector may deem necessary for enforcing compliance with any requirement hereunder.

6. All bags or other covering containing bones or bonedust shall, on being landed or imported, be stored and stacked at such place and in such manner as the inspector may approve and direct, and so as to render contact with and contamination to other articles impracticable or impossible.

7. The bags or other covering containing bones or bonedust shall be destroyed by the inspector or some person authorized by him, either by fire or by immersion in sulphuric acid, having a gravity of not less than 1.843.

8. Where any vehicle, article, object, or other thing shall come into contact with bags or other coverings containing bones or bonedust, or is likely to be affected or infected by such bags or coverings, bones, or bonedust, such vehicle, article, object, or thing shall, at the discretion, on the direction, and to the satisfaction of the inspector, be disinfected, by the owner, consignee, or agent thereof, with carbolic acid or such other disinfectant as the inspector shall authorize and direct.

9 In addition to all other requirements, the owner, consignee, agent, or other person desirous of introducing or landing bones or bonedust shall not, except in the presence and with the consent of the inspector—

1. Take delivery of or receive bones or bonedust imported into the State:
2. Treat the bones or bonedust in the manner prescribed:
3. Handle, displace, or remove any bag or other covering containing bones or bonedust.

10. The owner, secretary, or manager of the works where stock or fodder are treated after landing shall make a declaration in the form C hereto that such stock or fodder and all bags and packages used in connection therewith have been treated as required.

11. The inspector may detain for a reasonable time any stock or fodder pending enquiry and report from an analyst.

12. Any person importing stock or fodder may be required by an inspector to thoroughly disinfect any vehicle in which such stock or fodder have been conveyed after leaving the ship from which they have been landed.

13. All expenses of every description incurred in connection with the importation and treatment of stock or fodder, or the disinfection of any vehicle, article, object, or other thing, shall be paid by the owner to the inspector on demand.

14. A fee of ten shillings shall be paid to the inspector for every permit issued under regulation No. 2, and payment made to the inspector for every inspection undertaken by him at the rate of one shilling and sixpence per hour between the hours of 9 a.m. and 5 p.m., and three shillings per hour for each hour other than between the hours so mentioned.

15. Any person committing a breach of any of these regulations shall, on conviction, be liable to a penalty of not less than five-pounds, and not more than one hundred pounds.

A few explanatory notes in reference to the above regulations, and to the circumstances that have rendered their promulgation necessary, may not, it is thought, prove out of place here. It is but an act of bare justice to acknowledge that in drafting these regulations the department has received every help from the principal firms, whose business transactions the former will mainly affect. This feature in the work is the more pleasing inasmuch as on similar occasions it has not always been our lot to find those whose special personal interests might be supposed to be at variance with those of the community loyally co-operating with us for the public good.

As to the importance of exercising rigid control over importations into South Australia of bones and other minor animal refuse, there can exist no doubt. In many respects we must acknowledge to living in a land that has had a singularly fortunate past. We have, for instance, succeeded in keeping the dread phylloxera out of our vineyards; anthrax is unknown amongst our herds; and to-day, whilst swine fever is raging in neighbouring States, we are, much to the advantage of our export trade, in a position to give a clean bill of health to our pigbreeders. Such facts may be purely the result of fortune's caprices, or again they may not be unconnected with a rational supervision of our channels of communication with the rest of the world. The regulations under consideration have been brought into existence with a view to minimizing the chances of introduction of anthrax into the State; and in drafting them, that we are practically surrounded with contaminated States had to be steadily borne in mind. The disease has come to be looked upon as practically endemic in New South Wales and Queensland; the same may, perhaps, now be said of New Zealand; it exists in Victoria; and it has, we believe, latterly been recognised in Tasmania· Western Australia, on the other hand, appears, so far as we know, to be free from it. The great perniciousness of the disease is too well known to need any special reference. It is fatal to stock, and only a few days ago the daily press supplied us with an example from New Zealand of its transmissibility to man. India, the main source of our supplies of bonedust, is, unfortunately, a regular hotbed of the disease, and it is not unlikely that to importations from this country may be attributed its present general prevalence throughout Australasia. It is to be noted that New South Wales and New Zealand, the moister States in which bonedust is more generally used in the raw state, are the greatest sufferers. Here, where climatic conditions render it somewhat inoperative, except as superphosphate, we have hitherto escaped infection. It should not be forgotten, however, that on various occasions "bonemeal" has been recommended for stock when natural herbage has proved of defective character. Too much care cannot be exercised in ascertaining the origin of bonemeal used for such purposes.

Originally, following the example of New Zealand, I believe, most of the Australian States, ourselves amongst others, allowed of the introduction of bones that were accompanied by a certificate to the effect that they had been "subjected for at least two hours to a moist heat of a temperature of not less than 250 deg. Farenheit." This precaution proved ineffective; and it is easy to account for its failure, even admitting that there had occurred in practice no deviation from the spirit of the regulation. Bones are introduced into these States, not whole, but in the form of bonedust. To grind them in India is cheaper; and freight on bonedust is proportionately lower than on whole bones. Bones for export might be steamed ever so conscientiously, but it is too much to expect that special premises for treatment would be provided; and to grind them in the same mills as unsteamed bones, and to handle them in the same premises, amounts practically to rendering farcical the precautionary measure. It is a consciousness of these facts that has rendered necessary the adoption of our new regulations.

Imported bones will be admitted into this State at Port Adelaide, or any other port or border town which the Commissioner of Crown Lands will agree to, providing they undergo special local treatment, under official supervision, as indicated in the regulations. They may, at the option of the importers, be steamed under pressure; they may be burnt; or they may be converted into superphosphate. At the same time every precaution will be taken for the complete disinfection of all packages, bags, vehicles, &c., with which they may come in contact.

SWINE FEVER.

On July 27 and following days a conference of the Chief Inspectors of Stock of Queensland, New South Wales, and South Australia was held in Sydney to deal with the recent and widespread outbreaks of swine fever in New South Wales, Queensland, and Victoria. The following resolutions were carried unanimously by the conference:—

(1) That, when any infectious or contagious disease which warrants quarantine restrictions appears (or reappears after having been stamped out) in any stock in any of the States of the Commonwealth and New Zealand, it is recommended all the other States shall be immediately apprised thereof by telegram.

(2) That in the case of swine intended to be taken from one State to any other State, either by sea or land. it is recommended they shall be accompanied by a declaration by the owner or consignor that no swine fever exists in the district from which they are taken, nor had existed in the district for a period of three (3) months previously, and that the pigs had been in declarant's possession for a period of not less than 28 days.

(3) That, in the event of swine fever appearing in any State, it is recommended that all pigs actually suffering from that disease, and all those with which they may have been in contact, be forthwith slaughtered, and the sties and premises disinfected and placed in quarantine for a period of at least three (3) months,

(4) It is recommended that where contacts are slaughtered in accordance with resolution No. 3 and found free from disease, compensation shall be allowed, not to exceed half of the actual current value of healthy stock.

(5) That all owners of pigs and piggeries shall register their premises and number of pigs therein between the first and tenth days of January of each year with the Inspector of Stock for the district.

(6) It is recommended that legislation should be adopted in each State to compel owners to immediately report to the nearest Inspector of Stock the existence of any serious disease or mortality amongst their pigs.

(7) It is recommended that all meat or meat products exported from any State within the Commonwealth to any other State, country, or place, be accompanied by a declaration certifying that it has been duly inspected at time of slaughter by a qualified veterinary surgeon or certificated inspector, and found free from disease, and that official tags or labels be attached, or that it bears official stamp or brand intimating that it is free from disease.

(8) It is recommended that a uniform system of inspection of meat intended for interstate and foreign trade be adopted by legislation in the various States of the Commonwealth.

(9) It is recommended that goatskins from India, provided they are thoroughly disinfected, and accompanied by a certificate and declaration to that effect, be allowed into the States.

(10) That, in the opinion of this conference, it is desirable that all laws relating to the stock industry should be administered by the Stock Department.

(11) That the conference recommends that a biennial conference of the Chief Inspectors of Stock and Government Veterinary Surgeons of the various States and New Zealand be held in one or other of the capitals, and that the next conference be held in 1905.

Mr. C. J. Valentine, Chief Inspector of Stock for South Australia, in forwarding the above resolutions to the Hon. Minister of Agriculture, reports as follows:—

"The resolutions were arrived at after careful discussions, and recommended for action in the different States. The outbreak of so destructive a disease as swine fever necessitates strong measures to save and protect so important an industry as that of raising and fattening swine, which is of the greatest interest to the farming and dairying industry of the States, increasing in importance, and value every year. The immediate report of outbreaks by State officers from one State to the other is a preventive action which should be strictly carried out, and the noting of the movement of swine from one State to the other is of importance, and should be general. That all diseased swine should be destroyed and those in contact killed and thoroughly disinfected, and premises and lands, &c., quarantined, is the only certain action that can be taken to eradicate the disease. Milder measures would be weak, indeed pernicious. I would draw especial attention to the recommendation that when healthy contacts are killed the owners should receive half the market value. This disease is new to the States. The owners can in no way be considered blamable, and the action is taken for the preservation of the property of all swineowners in the State. The action taken by the Queensland Stock Department in destroying all diseased swine and contacts, and thorough disinfection of premises has saved that State from heavy losses. Over 400 swine were killed, and compensation paid for healthy contacts, premises, &c. This cost the State under £200. To a great extent this successful action may be attributed to the fact that the Stock Department had the sole control of the steps taken to eradicate the disease. Both in New South Wales and Victoria there are conflicting elements, the work being carried out by two departments. In both these States energetic steps are being taken, but the disease has spread over such long distances by the removal of store swine that it must be some time before it can be eradicated, and at a heavy cost. In New South Wales it has been decided to register all premises where pigs are kept, and that reports of deaths or sickness be made to the inspector. This course has been unanimously endorsed and recommended, and it would facilitate the inspection and enable the inspectors to check the movement of doubtful animals, which is the greatest factor for the spread of the disease. The recommendation for the inspection of meat products, and marking of all inspected products is suggested for favourable consideration. The loss to the States from the prohibition of goatskins from India, which are largely used for manufacturing purposes, is recommended to be removed under such restrictions as will allow the introduction without danger. I can recommend the favourable consideration of the resolutions arrived at by the conference as being of great importance for the protection and advantage of the great stock-producing interests of the State I have to acknowledge the assistance and courtesy rendered by the New South Wales Department to the members of the conference."

THE CODLIN MOTH REGULATIONS.

By Geo. Quinn, Horticultural Instructor.

In the following tables I have summarized the results of a referendum taken among the growers of apple and pear trees in this State upon several important phases of the codlin moth question

From the reports of the district inspectors of orchards a list of the names of growers reputed each to own not less than 200 trees of apple or pear was compiled. To each of these the following circular was posted.—

"Department of Agriculture, Adelaide, May 1st, 1903.

"Sir—It is the intention of the Government to introduce a Bill to Parliament dealing with the codlin moth difficulty. The Hon. Minister of Agriculture is desirous that such a measure shall prove acceptable to the majority of applegrowers who are interested commercially in the development of the industry and in the expansion of the export trade in apples and pears. With a view of obtaining this end I am directed by the Hon. Minister to ask if you will be good enough to assist me with your opinions on the points referred to in attached sheet?—I am, &c.,

"GEO. QUINN, Chief Inspector of Fruit."

About 250 replies were received, but only 202 of these were from persons owning the above stated number of these kinds of fruit trees. The 202 growers referred to claimed possession of a total of 193,541 apple and pear trees. As I do not consider a grower of less than 200 trees is seriously interested in the apple growing industry, the replies containing less than this number have not been included in the subjoined tables. In comparing the totals it will be noted they do not always agree. These differences are explainable by the fact that some growers omitted to give an opinion on some of the questions in the circular. Many growers availed themselves of the opportunity offered to make other suggestions. These were, however, mostly an elaboration of the opinions expressed in answer to the set questions in the circular. Although I do not consider it necessary to quote them here, use will be made of some of them in framing future regulations, and I take this opportunity of thanking those who took the trouble of forwarding the same

TABLE 1

INDICATING DISTRICTS, THE NUMBER OF REPLIES, AND TREES OWNED BY THOSE WHO REPLIED.

District	Number of Owners who replied	Number of Apple and Pear Trees owned by Growers who replied	Acreage calculated on a basis of 100 Trees per acre
Wirrabara .	9	9,455	94·5
Stanley .. .	22	21,880	218·8
Barossa .. .	29	24,634	246·3
Coonawarra .	13	17,260	172·6
Mount Lofty Ranges (outer)	61	69,092	690·9
,, ,, (inner)	68	51,220	512·2
Totals	202	193,541	1,935·3

EXPLANATION OF DISTRICTS

Wirrabara includes Laura, Wirrabara Forest, and gardens along the Rocky River.

Stanley includes the fruitgrowing country from Riverton to Upper Wakefield, Mintaro, Auburn, Watervale, Penwortham, Hill River, Stanley Flat, Armagh, and the localities immediately surrounding the town of Clare

Barossa includes Kapunda, Greenock, Nuriootpa, Tanunda, Williamstown, Keyneton and other portions of the district around the town of Angaston

Mount Lofty Ranges (outer) includes Gumeracha, Kersbrook, Milbrook, Chain of Ponds, Kenton Valley, Forest Range, Lobethal, and the country east of the Onkaparinga River including Mount Barker, Meadows, and Clarendon

Mount Lofty Ranges (inner) begins at Teatree Gully and takes in Houghton, Inglewood, Ashton, Uraidla, Aldgate, Bridgewater, Mylor, Upper Sturt, and Coromandel Valley as well as the hilly country immediately overlooking the plains of Adelaide

TABLE II

INDICATING RESULTS OF ENQUIRY AS TO THE ADVISABILITY OF MAKING ARSENICAL SPRAYING COMPULSORY

District	Owners who have tried Arsenical Spraying.	Number of Trees (Apple and Pear) owned by Growers who have tried Arsenical Spraying.	Owners favoring Arsenical Spraying.	Number of Trees (Apple and Pear) owned by those favoring Compulsory Spraying.	Owners opposing Compulsory Spraying.	Number of Trees (App'e and Pear) owned by those opposing Compulsory Spraying.	Percentage favoring Compulsory Spraying calculated proportionately to Number of Trees owned by those who replied.	Percentage opposed to Compulsory Spraying calculated proportionately to Number of Trees owned by those who replied.
							per cent.	per cent.
Wirrabara .. .	nil	nil	6	8,140	3	800	91	9
Stanley ..	16	19,508	18	19,158	4	2,722	88	12
Barossa ..	23	21,134	13	9,970	13	9,064	53	47
Coonawarra .. .	8	15,350	11	15,760	1	300	98	2
Mount Lofty Ranges (outer)	26	48,480	10	23,040	51	43,552	35	65
,, ,, (inner)	43	38,765	17	11,833	48	37,787	24	76
Totals	116	143,237	75	87,901	120	94,225	48	52

Those opposed to compulsory spraying are represented in the replies received by 94,225 trees; those in favour by 87,901.

The rapidly increasing confidence of the growers in the value of arsenical spraying is shown in the fact that in four out of the six districts majorities voted in favour of making its use compulsory. In the older districts, however, the inclination to await further developments was strong, and by a small majority the final totals are against compulsion at present. With this I concur, as until the growers become more conversant with the work nothing would be gained by compulsory spraying, carried out without that intelligent skill which complete confidence alone will call into activity.

TABLE III.

INDICATING RESULTS OF ENQUIRY AS TO THE ADVISABILITY OF CONTINUING THE PRACTICES OF BANDAGING AND CLEANING THE STEMS OF THE TREES.

District.	Number of Owners who favor continuing the practices of Bandaging and Cleaning the Stems.	Trees owned by those who favor continuing the practices of Bandaging and Cleaning the Stems.	Number of Owners who are opposed to continuing the practices of Bandaging and Cleaning the Stems.	Trees owned by those opposed to continuing the practices of Bandaging and Cleaning the Stems.	Percentages in favor of continuing the practices of Bandaging and Cleaning the Stems calculated proportionately to Trees owned.	Percentages opposed to continuing the practices of Bandaging and Cleaning the Stems calculated proportionately to Trees owned.
Wirrabara	7	6,405	2	3,050	68	32
Stanley .. .	17	18,851	5	3,029	86	14
Barossa	25	22,266	4	3,460	86	14
Coonawarra . .	13	17,260	nil	nil	100	
Mount Lofty Ranges (outer)	40	48,852	18	15,640	76	24
,, ,, (inner)	31	20,275	34	28,845	41	59
Totals	133	133,909	63	54,024	71	29

Those in favour of continuing the practices of bandaging and cleaning the stems are represented in the replies received by 133,909 trees; those opposed by 54,024 trees.

This table shows that where the growers are disposed to combat the pest they are determined to use every proved means of destroying it. A majority of 79,885 fairly establishes the value of bandaging and scraping the tree stems. Of those opposed to these measures were a number of very large growers, whose faith in the efficacy of their arsenical spraying was such that they considered these precautions (bandaging and scraping stems) were no longer necessary. A good many others who opposed these precautions stated in their opinion that every one should be permitted to band or scrape or omit to do so just as they thought fit.

TABLE IV.

INDICATING RESULT OF ENQUIRY AS TO THE ADVISABILITY OF PERMITTING THE UNRESTRICTED SALE OF INFESTED FRUIT.

District.	Number of Owners opposed to unrestricted sale of Infested Fruit.	Trees owned by those opposed to unrestricted sale of Infested Fruit.	Number of Owners favoring the unrestricted sale of Infested Fruit.	Trees owned by those favoring the unrestricted sale of Infested Fruit.	Percentage of those opposed to unrestricted sale of Infested Fruit calculated proportionately to Number of Trees owned.	Percentage of those in favor of the unrestricted sale of Infested Fruit calculated proportionately to Number of Trees owned.
Wirrabara . ..	9	9,435	nil	nil	100	—
Stanley	14	17,408	7	3,272	84	16
Barossa .. .	20	15,886	8	3,748	81	19
Coonawarra	13	17,260	nil	nil	100	
Mount Lofty Ranges (outer)	29	44,710	31	24,382	65	35
,, ,, (inner)	28	17,220	35	25,100	41	59
Totals	113	121,989	81	56,502	68	32

Those opposed to permitting the unrestricted sale of infested fruit are represented in the replies received by 121,939 trees; those in favour by 56,502 trees.

This table shows most conclusively that the men who are vitally interested in the apple growing industry do not wish to sell the infested fruits. In the young districts of Coonawarra and Wirrabara not a vote was recorded in favour of permitting the sale of the infested fruit. In Stanley, Barossa, and the outer Mount Lofty Ranges among fruitgrowers proper large majorities voted against the unrestricted distribution. In one district only, viz., the inner Mount Lofty Ranges, a small majority voted in favour of the free sale. In the aggregate the owners of 121,939 trees opposed the unrestricted sale, and 56,502 favoured it, or more than 2 to 1 against the sale. These opinions are from persons who have weighed the possible results of the course indicated in the replies they have given, and I humbly submit they should—in the framing of future laws upon this subject—have due respect attached to them. Some growers considered the infested fruits might be sold to factories in the centres of infection on condition that they were immediately used in manufacturing preserves or vinegar. Others thought they might be sold outside Goyder's line, where apples are not grown. Several large growers declared they were indifferent what action was taken; they were satisfied the amount of infested fruits which remained after they sprayed, &c., would not be worth consideration. In this latter view there is much with which I agree, but to limit the chances of getting any return for infested fruits would, in my opinion, be the form of compulsion most likely to lead to an intelligent and determined effort to subdue the pest by spraying or any other means found effective.

FARM AND DAIRY PRODUCE MARKETS REVIEW.

Messrs. A. W. Sandford & Co. report on September 1, 1903:—

In our former we reported dry conditions being experienced throughout the northern areas, which continued so far into August that farmers began to seriously fear that they had missed the seasonable rains; but, fortunately, towards the last week of the month useful rains have fallen on the south-western Queensland border and in our far north, but more especially during the past forty-eight hours the rainfall has been of such a general character that all the agricultural areas have participated in the downpour. Meanwhile graziers report plenty of feed and an average lambing season, this being more favourable in the middle and lower north, whilst farmers are now well satisfied with the prospects.

The commercial position throughout the State is generally sound, although traders complain of an exceptionally dull month's business. This can be partly attributed to the houses not caring to push sales owing to the unfavourable dry outlook; however, rain records just to hand are most glowing, and even Broken Hill, where they have been bringing water by rail service, yesterday received sufficient for several months' requirements; this will enable all the mines to again resume full working operations. In Metals, Silver has shown a slight firming, whilst Copper has fairly held up, but Lead is weaker.

Breadstuffs.—London advices per mail report fine weather, which enabled the bulk of a large haycrop to be secured in excellent condition. Heavy rain however, was falling at the date of writing, July 22, which, as harvest was near at hand, was not to be desired, and from cables to hand we gather that the harvest has been a wet one. From Europe the reports are more satisfactory, as the Wheat in the South of France was being harvested in excellent condition. America.—The Manitoba crop is not expected to be so heavy as last, but an increased area under Wheat will probably bring up the total produce to about the same quantity as in 1902. Melbourne and Sydney are both blocked with American wheat and flour, and as more is yet to arrive the holders will have some difficulty in clearing out before harvest. The feature in the Adelaide market has been repurchases of South Australian wheat from Sydney and Melbourne, and it is anticipated that 12,000 to 15,000 bags of our own wheat will be reimported within the next few weeks, and more is offering. This has made the larger mills careless buyers, and 5/4 is now an outside quotation for f.a.q. The Orpheus, with Argentine wheat, arrived, and came into port, but as only some 250 tons were disposed of here (country millers being the only buyers), she has been ordered on to Melbourne. Very little business has been done in Flour, though some 300 tons of Manitoba and Dorset were disposed of at prices under local quotations. Offal has been exceedingly quiet, and values are difficult to quote. In Forage, with no export orders coming along and feed plentiful, chaff merchants have had an unusually quiet month, so that their quotations are nominal. Scarcely any enquiry for Oats and Barley.

Although potatoes have been in strong demand throughout the month, resulting in stocks at Mount Gambier being considerably reduced, values remain unchanged. Onions continue plentiful, but as the season advances buyers are more critical with the sample, so that prime shows an improvement, whilst for off-condition lots lower rates have to be accepted to quit.

The conditions for the marketing of Dairy Products have been most favourable, and supplies of Butter have so rapidly increased that we already are having a surplus, but as values in Victoria have held up, this State has been enabled to readily place her extras in Broken Hill and Western Australia. As expected prices for Fresh in Prints had to give way about 3d. per ℔., but no material reduction now on these prices is likely to take place, as Factories are preparing to pack into bulk for export to the Home Market. In the Egg-producing districts this season is said to be quite a month earlier, but owing to the dearth of poultry it is generally reckoned that quantities of Eggs marketed will not compare with the flush of last year. During the month prices steadily eased, but as picklers have already started operations, values at the moment are firm. Cheese has had a good month's business, with quality showing a slight advance on former quotations. Bacon and Hams only met with dull sale, but as there has been a decided hardening in the Live Market, it is expected that an advance in value for the cured article is imminent. Honey has continued to move freely at higher rates. Beeswax in demand. Almonds. —Trade in this line has been slow, and prices show a slight easing.

In Carcass Pork the catalogues have not been just as heavy as is usual at this time of the year, but good selling rates were obtained for best quality, whilst Veal has been coming forward freely, prime stuff meeting with strong demand.

Live Poultry is meeting with excellent market, with satisfactory prices secured, especially for all coops of quality.

Market Quotations of the Day.

Wheat.—At Port Adelaide, shipping parcels, no demand; farmers' lots, 5/2 to 5/3 on trucks per bushels 60 ℔.

Flour.—City brands, £12 to £12 10/; country, £11 10/ to £12 per ton 2,000 ℔.

Bran.—11d. to 11½d.; pollard, 1/1 to 1/2 per bushel of 20 ℔.

Oats.—Local Algerian and Dun, 2/3; white champions, 2/6 per bushel 40 ℔.

Barley.—Malting, 4/2 to 4/6; Cape, 3/ to 3/3 per bushel 50 ℔.

Chaff.—£4 10/ per ton of 2,240 ℔., bags in, f.o.b. Port Adelaide.

Potatoes.—Gambiers, £2 10/ per 2,240 ℔.

Onions.—Gambiers, £2 5/ to £2 17/6 per 2,240 ℔.

Butter.—Creamery and factory prints, 9d. to 10d.; private separator and best dairy, 8d. to 9d.; well-graded store, 7¼d. to 8d.

Cheese.—S.A. best factory, 7d. to 8d.; ordinary, 5d. to 6d. per ℔.

Bacon.—Factory-cured sides, 7½d. to 8d.: farm flitches, 6¾d. to 7d.

Hams.—S.A. factory, 9½d. to 10½d. per ℔.

Eggs.—Loose, 8¼d.; in casks, f.o.b., 10d. per dozen.

Lard.—In bladders, 6d. to 6½d.; tins, 5d. to 6d. per ℔.

Honey.—3d. for best extracted, in 60-℔. tins; beeswax, 1/1½ per ℔.

Almonds.—Fine softshells, 5d.; kernels, 11d. per ℔.

Carcass Meat.—Fair baconers to prime shop porkers, 5d. to 6d. per ℔.; medium to fair, 4d. to 5d.; good vealers, 2½d. to 3½d.; poor to medium, 1d. to 2d.

Poultry.—Dressed turkeys, 7d. to 8d. per ℔.; fowls, 6½d. to 7½d. In live birds, heavy weight table roosters, 2/ to 2/6 each; good hens and fair-conditioned cockerels, 1/5 to 1/10; poor and light, 1/2 to 1/4; ducks, 2/ to 3/; geese, 2/9 to 3/; pigeons, 7d.; turkeys, 5½d. to 7½d. per ℔. live weight for poor to good table birds.

Above quotations, unless when otherwise specified, are duty-paid values on imported lines. Grain, flour, and forage for export are f.o.b. prices at Port Adelaide. Dairy products are city auction mart rates. In grain, chaff, and potatoes sacks are included, but weighed as produce. Packages free with bulk butter and cheese.

MONTHLY RAINFALL.

The following table shows the rainfall for the month of August, 1903:—

Adelaide	2·34	Manoora	2·35	Echunga	4·09
Hawker	1·19	Hoyleton	2·21	Macclesfield	3·66
Cradock	0·94	Balaklava	1·91	Meadows	4·38
Wilson	0·80	Port Wakefield	1·64	Strathalbyn	2·42
Gordon	0·72	Saddleworth	2·15	Callington	2·34
Quorn	0·56	Marrabel	2·34	Langhorne's Bridge	1·80
Port Augusta	0·62	Riverton	2·37	Milang	1·90
Port Germein	1·14	Tarlee	2·19	Wallaroo	0·78
Port Pirie	0·90	Stockport	1·81	Kadina	1·12
Crystal Brook	1·52	Hamley Bridge	1·78	Moonta	1·10
Port Broughton	1·17	Kapunda	2·38	Green's Plains	1·50
Bute	1·14	Freeling	2·07	Maitland	1·72
Hammond	1·12	Stockwell	2·99	Ardrossan	1·52
Bruce	0·82	Nuriootpa	3·15	Port Victoria	1·06
Wilmington	1·32	Angaston	3·06	Curramulka	1·69
Melrose	1·68	Tanunda	3·14	Minlaton	1·88
Booleroo Centre	1·47	Lyndoch	2·64	Stansbury	1·65
Wirrabara	1·93	Mallala	1·99	Warooka	1·37
Appila	1·71	Roseworthy	1·66	Yorketown	1·40
Laura	2·22	Gawler	1·67	Edithburg	1·47
Caltowie	2·35	Smithfield	1·52	Fowler's Bay	0·68
Jamestown	1·79	Two Wells	2·17	Streaky Bay	1·17
Gladstone	1·83	Virginia	1·79	Port Elliston	2·06
Georgetown	1·77	Salisbury	2·65	Port Lincoln	2·94
Narridy	1·77	Tea Tree Gully	2·88	Cowell	0·82
Redhill	1·86	Magill	2·83	Queenscliffe	2·31
Koolunga	2·08	Mitcham	2·36	Port Elliot	2·88
Carrieton	1·39	Crafers	4·08	Goolwa	3·01
Eurelia	0·93	Clarendon	3·72	Meningie	2·08
Johnsburg	0·76	Morphett Vale	2·18	Kingston	3·51
Orroroo	0·84	Noarlunga	2·43	Robe	3·58
Black Rock	1·02	Willunga	4·07	Beachport	3·75
Petersburg	1·32	Aldinga	2·76	Coonalpyn	1·55
Yongala	1·47	Normanville	4·00	Bordertown	1·48
Terowie	1·39	Yankalilla	4·24	Frances	2·07
Yarcowie	1·56	Eudunda	1·95	Naracoorte	2·59
Hallett	1·99	Truro	1·79	Lucindale	3·06
Mt. Bryan	2·33	Palmer	1·86	Penola	2·78
Burra	3·00	Mount Pleasant	3·07	Millicent	3·50
Snowtown	1·88	Blumberg	3·17	Mount Gambier	4·18
Brinkworth	1·94	Gumeracha	3·99	Wellington	1·42
Blyth	1·75	Lobethal	3·57	Murray Bridge	1·22
Clare	2·97	Woodside	3·39	Mannum	1·24
Mintaro Central	3·06	Hahndorf	3·90	Morgan	1·00
Watervale	2·87	Nairne	3·31	Overland Corner	0·96
Auburn	2·69	Mount Barker	4·13	Renmark	1·06

AGRICULTURAL BUREAU REPORTS.

Yorketown, July 11.

Present—Messrs. Correll (chair), Koth, Domaschenz, Jung, C. and A. E. Anderson, Vanstone, Bull, Davey, Latty, and Newbold (Hon. Sec.).

Annual Report.—Seven meetings held during the year with an average attendance of nine members. Generally more interest had been manifested by the members in the work. The visit by Professor Towar last spring was much appreciated by the farmers of the district. Mr. W. Correll was elected Chairman and Mr. R. Newbold re-elected Hon. Secretary.

Arden Vale, July 6.

Present—Messrs. Warren (chair), Eckert, Pearce, Fricker, G. W. and F. H. Williss, Francis Schutloffell, Klinberg, and Hannermann (Hon. Sec.), and four visitors.

Cultivator v. Scarifier.—Mr. E. H. Warren read a paper on this subject. There was no question that production throughout Australia would have to be cheapened if they were to make a living out of wheat growing in competition with other countries. Improved machinery and implements were the groundwork of cheapness in production. In their northern country anything that will reduce or largely take the place of horses, and, consequently, the outlay for horsefeed, will be a great factor in this direction. It was in this connection he wished to discuss the cultivator, which he preferred to the scarifier for their district. The draught of the cultivator was less, due, he thought, to the fact that it was easier to draw three tines cutting four inches each to one tine moving 10 inches to a foot of ground, as was the case with the scarifier. Then the more tines the better was the land pulverized; for the penetration of a hard surface set implements were better than those of stump-jump class. The action of the spring-tooth cultivator was quite different; the implement itself was light but the springs keep the tines in the soil. The cultivator has been improved in this State, the pressure being on the rear of the section instead of on the centre. If the implement could be lengthened and a seedbox attachment added without increasing the draught too much, they would have an ideal implement. The points of the tines should not be more than 3 inches or 4 inches in width. Most of the members doubted the merits of the cultivator, and Mr. Eckert, who has recently purchased one, condemned it strongly; he considered the scarifier preferable, especially for hard land. Mr. Pearce had been trying the reversible steel plates for his scarifier, but found them too mild for his work.

Elbow Hill, July 21.

Present—Messrs. Dunn (chair), W. and J. Ward, Wills, Robertson, and Pike (Hon. Sec.), and nine visitors.

Lessons of the Drought.—Mr. W. Ward forwarded a paper on "What do we learn in dry seasons?" He thought one of the strongest lessons they had received was the necessity for providing stores of feed for their stock. In 1901 they could have saved more feed than they did by using the binder. He thought they should make a practice of cutting at least 50 acres each year with the binder, which could be threshed and the straw saved for future use. Members were of opinion that the binder would in the future take a more prominent part in farming operations in this district. Mr. Dunn read extract from July issue of The Journal of Agriculture, in which the writer advocated cutting the straw immediately after stripping and saving it for food.

Ice Plant.—Members reported that this weed was spreading rapidly in the loose soils, and rolling was suggested as a means of destroying the plant. Members would like to know whether members of other branches can suggest any effective treatment.

Boothby, July 14.

Present—Messrs. Whyte (chair), Chaplin, Carn, Bradley, Foulds, Henderson, Way, Sims, and Turnbull (Hon. Sec.), and one visitor.

Annual Report.—Six meetings held, with an average attendance of seven members. Four papers had been read, and a public social gathering held. The very severe season had made it difficult to carry on the work of the branch.

Hoedrill v. Discdrill.—Discussion took place on the relative merits of the two classes of seeddrills, members generally favouring the discdrill, and especially for dirty land.

Rabbit Destruction.—Mr. Bradley reported that he was very successful in destroying rabbits in their burrows with fumes of sulphur and saltpetre. He dissolved 8 oz. of saltpetre in sufficient water to saturate an old wheatbag, which, when dry, he cut into pieces about 4 inches to 6 inches square. The pieces of bagging were then doubled up and dipped into boiling sulphur. As soon as they are dry the bagging is ready for use, and one should be placed in each burrow leading to the warren, being protected with brush or stone, to keep the dirt from falling in on it. Each piece of bag is then lighted and the earth covered over the burrow entrance.

Dowlingville, July 10.

Present Messrs. Illman (chair), Phelps, Mason, Crowell, Whittaker, Holland, and Lock (Hon. Sec.).

Management of Farm Horses Mr Lock considered the question of great importance to farmers. The better the horse was managed the more profitable it was to the owner. Bad management quickly resulted in deterioration. He thought the feeding had a good deal of bearing on the question of sore shoulders. At one time he used to give his horses a good bit of boiled wheat and wheat chaff, and frequently had them suffering from sores. For some years he had been feeding with wheat chaff, pollard, and dry oats, mixed with a little salt, and scarcely ever had a horse affected with sore shoulders; besides which, they were more spirited. Mr. Phelps gave his working horses short feed morning and noon, and long hay at night. To prevent sore shoulders he advised keeping the collars fairly tight. Mr. Montgomery was afraid the trouble was partly due to the fact that with a team of six or eight horses a man had not sufficient time to attend to them as he should do. Often the collars were put on when still damp from perspiration. Mr. Phelps had been giving his horses molasses mixed with oats, in addition to chaff and hay, and found they did better work than usual. He did not think he had this year used half the quantity of oats that he used to formerly. For sore shoulders he thought Condy's fluid the best dressing.

Minlaton, July 25.

Present—Messrs. Martin (chair), Mayer, Correll, Anderson, Boundy, Bennett, Brown, and McKenzie (Hon. Sec.)

Field Trial.—It was resolved to arrange for a field trial of a locally manufactured seed and fertiliser drill.

Dairying.—Considerable discussion took place on paper read at previous meeting by Mr E. Correll, members generally agreeing with the writer.

Young Farm Stock.—Mr. John Anderson read a paper on this subject. To get the most suitable kind of stock for the different classes of farm work it was generally necessary for the farmer to breed and rear them himself, as usually the right class cannot be purchased in the market. The first thing, therefore, to consider was what did they require, and then having decided this he would urge that only the best of stock be bred from. The results would always be more reliable when both the parents were purebred, though not necessarily of the same breed. This applied to all stock equally. Having secured the young animals, he was a strong advocate for keeping them in good condition; there was nothing to gain and a good deal to lose by stinting them when young. With large stock it was most important that the dam should have plenty of good food while suckling her young. In all cases he would advocate the castration of the males before they were weaned, as they will get over the operation quicker than at a later date. With horses, the best time for the mares to foal was in August, or even earlier, if feed is plentiful. The early foals, as a rule, thrive better than late foals. Cows should be timed to calve at the season most suitable to individual circumstances.

Annual Report.—The Hon. Secretary reported on proceedings since previous annual meeting in May, 1902. Thirteen meetings had been held with an average attendance of 7·5 members. The resolution carried last year that each member should take it in turn to read a paper had worked very well, only one member failing to fulfil his obligation in this direction. The attendance generally had not been satisfactory. Some members had only attended two or three meetings. The Hon. Secretary had attended every meeting as the members seemed to expect he would, yet he could see no reason why members who do not attend regularly themselves should expect the Hon. Secretary to do so. He considered that it was the duty of every member to attend the meetings whenever it was possible to do so. With a view to securing fresh blood he suggested that members should retire after a certain number of years; it hardly seemed fair that they should retain their positions for years to the exclusion of others. Failing this, he would suggest an increase in the membership of branches. Experimental work with rust-resistant wheats had been carried out during the year, various manures had been tested, and included in other tests had been experiments with lucerne, which fodder crop appeared to promise well in this locality. He thought that much good would result if the Government were to give the branches more help in carrying out experiments with manures, seeds, &c. Professor Towar had paid them a visit during the year. In his opinion the officers of the department should visit the branches to a greater extent than in the past.

Gawler River, July 10.

Present—Messrs. H. Roediger (chair), Kreig, Hillier, Leak, Badcock, F. Roediger, Winckel, Barrett, Day, and Bray (Hon. Sec.).

Orange Scale.—It was resolved that this branch favours the enforcement of the present regulations prohibiting the sale of fruit, &c., infested by orange red scale.

Farm Implements.—Mr. Day read a paper on this subject. While they could not farm to advantage without the seeddrill and the twine binders, some of the more recently introduced implements had not been altogether a success. The spring-tooth cultivators, in his opinion, did not work as they should, the shares having a tendency to slip over strong weeds, and in stony ground they wanted something that would give. Then, if the spring is tempered to keep its original set it is likely to break in rough land, while, if not well tempered they draw back and the share will drag instead of cutting. For plain land, free of stones, he would not recommend the spring-tooth cultivator. The Schrapel scarifier was light yet firm, and he believed a very good implement. Recently there was held in this locality a trial of the sulky cultivator, lever harrow, and disc harrow. He thought the lever harrow a very likely implement, but was not favourably impressed with the other two. The disc harrows left the soil too ridgy for the use of binders. Mr. F. Roediger stated that these harrows were largely used in some parts of Victoria, but where the crop was harvested with the binder they were unsuitable. Opinions were divided as to merits of the lever harrows, some members being of opinion that they would be particularly useful in harrowing growing crops. For plain land members thought the Schrapel pattern of cultivator very useful. For rough, stony land an implement that will stand the work without being too heavy was required. It was agreed that the spring-tooth cultivator was not equal to the scarifier for destroying weeds, except in the early stage of growth, and also that it required more horse strength to cover the same area to the same depth as the scarifier. In rough, stony land it was, however, a useful implement.

Willunga, July 4.

Present—Messrs. Blacker (chair), Richards, W. and J. Binney, Allen, Atkinson, Vaudrey, Malpas, Brown, and Hughes (Hon. Sec.).

Officers.—Messrs. T. Pengilly, W. Binney, and J. A. Hughes were elected Chairman, Vice-Chairman, and Hon. Secretary respectively.

Prospects of the Fruit Industry.—On July 16 Mr. George Quinn gave a very instructive lecture on the fruit industry. He had been very strongly impressed with the possibilities of the district in this direction. On the gentle hill slopes as well as on the rich soil of the plains he was convinced that currants would do well, and even with the reduced prices which would most probably prevail with an increase in production they would be profitable. Almonds should do well here, especially when planted in rows around the orchard or vineyard. Large plantations do not appear to be a success, the inner rows of trees failing to set their fruit properly. Although the Brandis almond fetched the highest price per pound, the Californian paper shell would yield a greater proportion of kernel as compared to the weight of the shell. Apricots would do well in this locality, and should pay for drying. Prunes at present prices should be well worth growing. For apples and pears much of the land in the ranges was eminently suited, and he thought that considerable quantities of each would be produced in the future. The export should provide a profitable outlet for both apples and pears. A number of questions were asked and answered by Mr. Quinn, who was accorded a hearty vote of thanks for his address.

Naracoorte, July 11.

Present—Messrs. Foster (chair), Wardle, Duffield, McKay, Coe, and Schinckel (Hon. Sec.).

Dairying.—Mr. Wardle stated that he had found the practice of rugging cows distinctly beneficial. For impaction he had proved the following drench effective, viz., a teaspoonful each of gunpowder, saltpetre, and whiting dissolved in two pints of vinegar.

Grasses for Pasture.—The Chairman read a paper on the cultivation of grasses and other fodders. Where conditions suit there was no question that lucerne ranked first. It required a deep, rich soil, with plenty of humus to give the maximum return; but there were many places in this locality where it would do well. It would be well to try it on some of the good loams and black plain land overlying a mixture of clay and marl, and with water within easy reach. Seed should be sown in September or October, the land being thoroughly worked beforehand. Half a hundredweight of bone super per acre sown with the seed would give the young plant a good start. Best results are secured where the lucerne can be irrigated during the summer. It was better to cut the crop and feed the stock instead of allowing them to graze on the land. Rye grass would be found a good doer on the black soil, but not on sand or loam in this district. In some parts of the south-east sowing down the land to rye grass has increased the carrying capacity fourfold. Prairie grass, cocksfoot, foxtail, crested dogstail, and Yorkshire fog have all done well in different parts, but will not stand sheep grazing on them. None of them can be regarded as summer grasses. Clovers do well for a time, but are short-lived here. North of Naracoorte a number of clovers appear on the plains after the land has been manured with super, and these last quite as long as the imported clovers, and give just as good food. The burrs on the native clover are, however, objectionable in the wool. For the moist sand and loamy soils he believed Paspalum dilatatum would prove the best summer grass. On the black land it did not do well with him, but on sandy loam it was very promising. He noticed that guinea grass was very highly spoken of by Mr. Jenkins, of Balhannah, and it should be well worth trying here. Several members advised sowing lucerne in April. The Hon. Secretary found barley the best to sow with it for protection. Red clover was mentioned by Mr. Buck as doing well in some parts of the district.

Lumpy Manure.—Mr. Duffield drew attention to the lumpy condition in which some manure had been sent out, especially Thomas phosphate, and wished to know whether any of the strength of the manure was lost. [Not necessarily, but to ensure regular distribution, and to enable the soil moisture to act on the constituents of the manure, it is important that it be in a fine state of division.—Ed.]

Pickling Seed Wheat.—Mr. Buck had sown 40 acres with wheat pickled with bluestone at rate of ½-lb. per bag in strong brine for from 15 to 20 minutes; but the seed had germinated very badly. On another field he sowed seed pickled in the same manner; but, in addition to putting 56 lb. per acre of super in with the seed he applied 56 lb. of lime with very good results. Where the lime was shut off and 1 cwt. of super applied the germination was bad. Members could not account for the failure, unless the seed had been left in the pickle too long.

Tree Planting.—Mr. Schinckel urged the necessity for planting trees in this locality. Good firewood even was not now plentiful near the township, and he was convinced it would pay them to grow either black wattle or sheaoak for firewood. Both would grow on their otherwise waste land, and the former would yield a profitable return from the bark. Timber for buildings, fences, and railway sleepers would become scarcer every year, and he was certain that it would pay to plant suitable kinds of trees, as if they got nothing themselves from the trees their children would profit. Mr. Wardle stated that he was getting 10 posts per tree from some trees he planted 10 years ago. He was continually planting trees, and thought every farmer should do the same. He got better results from trees raised by himself than from those received from the Forest Department. Most seed he planted in February, and set out the trees when he had leisure. Wattle seed should be planted about August.

Inkerman, July 7.

Present Messrs. C. H. Daniel (chair), Smart, Sampson, Board, Mugford, Lomman, Fraser, and C. E. Daniel (Hon. Sec.).

Pig Breeding.—The Hon. Secretary read a paper on breeding and keeping pigs. He was confident that there was a substantial income to be made out of pigs in this district, if properly managed. To do that about 200 acres of land and a fair amount of capital would be required. About half the land should be divided into not less than five paddocks, and be fenced with pig-proof fences. The ring-fence should be 3 ft. high, to keep out other stock; posts, 27 ft. apart, with three iron droppers between. The fence should be of six wires, the first two barb, the next plain and barb wire alternately. The five lower wires should be about five inches apart, and the top wire 10 inches from the one below it. For plain wire Waite's special was best. The division fences would be the same as the ring fence, except the top barb wire would not be required. The ring fence would cost about 4/ per chain, and the division fences would cost 3/ per chain, or a total cost of £40, besides labour. In addition, a smaller wire-netted paddock for young pigs would be required. A rough shed and straw stack for shelter should be provided in each paddock. Each year one paddock should be cropped with peas one with a mixture of barley and oats, and the other two with barley. These paddocks, together with the wheat that could be grown on the rest of the farm, would keep a large number of pigs the year through. About 15 breeding sows could be kept, and when feed is plentiful in the paddocks stores could be bought for fattening. As a change, and to assist in topping up, copra cake and molasses might be used with advantage. It was surprising how quickly pigs improve with this addition to their food. A number of styes would be needed. Their cost would depend on materials available. A barn for the grain and a large boiler for boiling the food would also be necessary, and water must be provided in each paddock. Where a permanent supply of water is available a small area of lucerne should be grown under irrigation. When the pigs are shut up for fattening he would advise the bulk of the grain be barley, as a larger yield than wheat per acre can be grown. He thought it advisable to vary the method of preparing the food. Sometimes the grain should be boiled, sometimes crushed, and occasionally soaked for a day beforehand. He would prefer to breed from a long raking sow crossed with a good Essex boar. He would not mind much if the sow was a bit narrow and fat sided, provided she was a good mother. These sows, as a rule, will produce large litters compared with the pure-bred Essex or Berkshire, and for bacon the progeny was decidedly better, though the pure breeds might produce porkers at an earlier age. On every farm at least two brood sows should be kept, and two or three small paddocks fenced off for rearing pigs. Some of the members did not think the writer's methods practicable, nor was the fence considered pig-proof. Mr. Smart did not believe in the long-nosed pig favoured by the Hon. Secretary, preferring a pig short in the nose and broad in the back. Pigs should be fed three times a day, the styes kept scrupulously clean, and where the floor is good enough all the solid food fed on the floor.

Strathalbyn, July 20.

Present—Messrs. Sissons (chair), McAnaney, Cockburn, Blake, Rankine, Reed, Watt, and Cheriton (Hon. Sec.).

Horsebreeding.—Paper read at previous meeting by Mr. Mules on how to breed a hack was well discussed, members generally considering the lines laid down as not being applicable to small farmers, though suitable, perhaps, for large stations.

Rugging Cows – Mr. P Cockburn read a paper on this subject. He gave particulars of four weeks' test with six cows. He first used rugs made of wheat bags, but did not consider them suitable, being too small and not waterproof. He was now using light waterproof rugs, which can be purchased at a reasonable cost. He was in one sense unfortunate in getting exceptionally cold weather during the period of the test, on one occasion the glass showing a lower reading than any recorded there during the past 30 years. The results of the test were as follows:—During the week previous to rugging the yield was 525 lb. of milk, the following week 552 lb., showing an increase of 27 lb.; third week, 589 lb., an increase of 29 lb.; fourth week, 549, showing a decrease of 34 lb. This he put down to the heavy frost on Friday, the 10th July, which not only was extremely trying to the cows, but also cut down the feed to no small extent. The cows have been picking up their own feed all the time, and the milk has been taken from the same six cows, which have had no special treatment to increase the milk; they were all kept in the open paddock as usual. One thing he would point out, and that is that it is very necessary that on a warm day the rug should be removed. He was convinced that rugging was well worth adopting. He had been unable to test the effect on the percentage of fat in the milk, owing to the directors of the local factory not giving the manager facilities for testing the milk. He thought this a great mistake, and although he would not go so far as to advocate tests being made free of charge, he certainly thought it to the advantage of the factory to undertake tests at actual cost of materials. It was true that milk was not purchased at the factory, but there was no doubt that it would pay to give the cream suppliers facilities for finding out which were their best cows. Considerable discussion took place on the question of rugging of cows, opinions being about equally divided.

Quorn, August 8.

Present—Messrs. Thompson (chair), Rowe, Cook, Finlay, Venning, Potter, McColl, Brewster, and Walker.

Business.—The hon. secretary forwarded sample of London Market cabbage, weighing [illegible] lb., grown by him. Members considered this a splendid sample. The Chairman read extracts dealing with the value of copra cake for feeding stock; a good daily ration for draught horses was given as 18 lb. to 20 lb. chaff, 10 lb. to 12 lb. maize, and 8 to 4 lb. of oil cake.

Golden Grove, July 9.

Present—Messrs. Milne (chair), Buder, Maughan, Rawlings, Harper, McEwin, Angove, Ross, N. J. and A. D. N. Robertson (Hon. Sec.), and two visitors.

Poisoning Rabbits.—Mr. Harper wished to know the best way to apply strychnine to apple twigs to poison rabbits. He had found the bark completely stripped of the young growths pruned from the apple trees, and thought if poison were applied to these cuttings he would be able to destroy the rabbits. [The method adopted of treating sandalwood twigs for poisoning rabbits is as follows:—Strychnine and Sandalwood.—Dissolve 3 lb. or 4 lb. sugar in 2 galls. water; add 2 lb. flour made into a nice smooth paste; dissolve 1 oz. pure strychnine by boiling in ½ pint of good vinegar, and mix all well together. Dip twigs into this and lay: the rabbits will die on the spot. This would doubtless be just as effective with apple twigs.—Ed.]

Pig Complaint.—A member reported that having a sow with pigs six weeks old, he took the young away to wean them, and put the sow in the yard; half an hour later he found she had completely lost the use of her hindquarters without any apparent cause. None of the members could suggest cause or treatment.

Bordeaux Mixture.—Mr. Angove said he was incorrectly reported in July issue of The Journal when dealing with the manufacture of Bordeaux Mixture. He stated that if properly made the liquid, when all the precipitate had settled, would be colourless; if any colour remains more lime and not water, as stated in report, should be added. Mr. Maughan was not satisfied on this point, as he always noticed a blue tinge in the liquid, even after it had been standing for twenty-four hours. To settle the matter he made some Bordeaux Mixture in the ordinary way in the presence of the members, and then Mr. Angove put the liquid into a glass, added some more lime and filtered it (in order to save time), showing a perfectly colourless liquid. Mr. Angove then pointed out that if the blue tinge remained after being allowed to stand for twenty-four hours the mixture was not properly prepared, some of the copper not having been dissolved. The undissolved portion would therefore be wasted, though the loss would probably be very small.

Reeves Plains, July 10.

Present—Messrs. George (chair), Worfel, Cosden, Jenkins, J. G. and A. H. Folland, Oliver, W. H., W., and H. Day, and McCord (Hon. Sec.), and several visitors.

Tree Planting.—Mr. H. E. Laffer, of the Roseworthy Agricultural College, gave a paper as follows:—The subject of tree planting, both from a useful and an ornamental point of view, is one that is too little studied by the average landholder. Often, even in districts favoured by a good rainfall, the house is perched on a hill or on some open plain with scarcely a tree to relieve the monotony of the landscape. Nothing can be more dreary and cheerless for those who spend their lives under such conditions. Many may say they have tried to grow trees and flowers but without success, and put the failure down to dry conditions. Very often, however, they have been in a hurry to do too much at once, and have been unable to give it proper attention owing to pressure of other necessary work. It is far better to do a little at a time—just as much as can be properly tended in spare moments. Then, again, failure may be due to planting unsuitable trees. A man writes to a nurseryman and asks for a certain number of ornamental trees, and trusts to luck as to whether such trees will thrive under the conditions of the country in which they are to be planted. Some grow well, others indifferently, and many not at all. Though every care is supposed to have been taken, yet some important detail may have been left out, such as planting too late and neglecting to water as soon as planted. It may be said that there is no water for such things, but how much waste water is thrown out each week where it is of practically no use which, if properly used, would be sufficient to keep a few young trees and flowers growing through the hottest and dryest months. Given that the trees are adapted to the conditions of climate and soil under which they are planted, once fairly established, little or no artificial watering will be necessary. Considered from the point of view of utility, tree planting has even greater claims on the time of a landholder. A farm studded with belts of timber of almost any kind and a homestead surrounded with trees is worth perhaps a third more if put upon the market to be sold. Belts of timber, either around fields or planted in clumps, constitute a shelter for stock in all weathers. Stock so sheltered will remain out and do much better than that not so protected. Then, again, timber is always a valuable asset on a farm. Year by year land is cleared of trees and very little is done to replace the natural forest. Consequently the country is gradually becoming denuded of timber; winds, having free play, sweep across the length and breath of the land, raising dust-storms and playing havoc with crops and vegetation of all kinds. It may be said that timber belts rob the crops in a field. This is very true, but then, the tree must draw its nourishment from the soil as well as the wheat crop. The tree, being stronger, overcomes and starves the weaker crop of wheat. Would it not, then, be better to give the tree the space it requires, allowing that it is paying you to do so? No farmer will try to take two crops from land which will only grow one, and the same thing applies to growing crops right up to the trunks of trees which are intended as a shelter to the crop itself. The first essential to successful forestry is to procure those trees suitable to the climatic conditions under which they were living. One of the most suitable trees for their district, and for all kinds of light land with a low rainfall, is the Aleppo pine, which will flourish on the poorest of limestone ridges, and will make handsome trees in a few years. On sandhills, also, it grows quickly once started. A clump of these trees soon forms a splendid breakwind. On the heavier soils its place may be taken by the Canary Island pine. Members of the eucalyptus family, notably the sugar gum, are very rapid growers. When planted close together they quickly assume fair proportions, and can be thinned out to the required distance apart The wood so obtained can be put to many uses where, probably, other timbers would have to be bought. To surround a house one could not wish for a more handsome tree than the carob. It is extremely hardy, and where little water is obtainable makes fairly rapid growth. The beans obtained from this tree are excellent pig feed. In countries where the tree is much grown the beans are ground and fed to stock in the form of meal, which is very nutritious. Among the smaller trees the olive, tagosaste, and tamarisk might be mentioned. The olive thrives on limestone soils, and even if the fruit is put to no other use it is valuable as poultry feed, turkeys especially being very partial to it. The tagosaste is a first-class quick-growing hedge plant, and when allowed to grow without trimming will reach a height of from 10 to 15 feet. For our dry sandhills the tamarisk will be hard to beat. Once established and trimmed every year it grows quickly, making a beautiful dark green hedge when planted about three feet apart. The tree grows readily from cuttings. Pines should be planted out early in the season so that they may become established before the warm weather sets in. They grow very readily from seed, and by far the best plan is to sow the seed in pots sheltered from the wind and sun at about November or December. By keeping them moistened during the summer the young pines can be transplanted in June without disturbing the roots. Another plan adopted at the college this year promises to be very successful. That was to sow seeds early in the year when the ground was dry on the spot where the tree was to grow. After the first rains, the land being warm, the seeds germinated readily, and are now growing nicely. From two to three seeds were put in at each place, and when the pines are established the surplus ones will be removed. Under certain climatic conditions there is every possibility of a hot north wind before the trees are set in the soil, and if they have not a good hold, the roots are unable to supply sufficient moisture, and the trees are checked beyond recovery. Therefore it is the safest plan to disturb the roots as little as possible, and it is plainly evident that a tree established from the seed has a better chance even than one transplanted from a pot. Gumtrees will be found to do better if planted when the weather begins to warm up and the chances of frost are minimised. All the smaller trees mentioned, such as the olive, tagosaste, and tamarisk, may be planted out at any time during the winter. Tamarisk cuttings if planted now in sandy soil should root readily. With reference to the preparation of the ground and the planting of the trees, the method will vary slightly. Should the ground be heavy, the best plan is to break it up to a good depth with the plough, say

8 to 9 inches, or deeper if possible. This method gives plenty of loose soil for the young roots to penetrate quickly, and then once they are established the stronger roots push their way down through the harder subsoil. The large surface of loose broken soil affords ample room for the absorption of moisture, and will retain it better than if the trees were simply planted in holes surrounded by hard soil. Where the soil is lighter and more open such deep ploughing is unnecessary, and in sand probably the best way will be to simply open out holes where the trees are to be placed. When the land is ready to receive the trees holes should be opened out, not necessarily large holes if the land has been properly prepared, but just sufficient to give loose soil to properly surround the roots. Care must be taken not to allow the roots, especially those of evergreens, to become dry. This is easily prevented by taking an old tin bucket, mixing up some clay and water to the consistency of cream, and puddling the roots in it before planting. The tree is taken right out of this and placed in the soil, the fine coating of liquid mud adhering to the roots more readily, forming a close connection with the soil. It is always safest to give a certain amount of water to each tree immediately after planting. At any rate with evergreens this matter should never be neglected. After this, unless the weather should prove exceptionally dry, it will be sufficient to keep the surface soil loose about the plants. When placing the tree in the soil care must be taken not to bunch the roots. If the trees are worth planting at all, it is worth a little extra time to do the work well. All roots should be carefully spread out and distributed over the surface on which the tree rests. The tap root, if there should be one, is let straight down into the soil as it would grow naturally. Instances are on record where trees, having grown to a considerable size, have died, and on being grubbed up the roots were found to be twisted and matted, the whole root system not occupying a space larger than a washing tub. Had these trees been planted carefully their lives might have been prolonged indefinitely. Touching on the subject of fruit trees, even in this district much might be done to provide a supply of fresh seasonable fruits to the house. Apricots will do fairly well, and though the life of the tree is not long, yet it will pay to try a few of these. Early peaches will do fairly well, and with water much might be done with the later varieties. Even with apples and pears on the better soils a fair measure of success may be obtained. In a sheltered spot oranges might be worth trying. There is only one orange tree at the college, but that has had no artificial watering whatever, yet the tree looks so well they intended trying a few more to see what the effect of Barossa water will be. As in the case of forest trees, a little care in planting will be amply repaid by the more rapid growth made by the young tree. Members generally agreed that tree planting in this district was necessary, both for breakwinds and to provide shelter for stock. Most of the members thought it was a good plan to grow a few fruit trees of suitable kinds, although some held that they could buy fruit so cheaply it was not worth the labour and expense of growing. A hearty vote of thanks was accorded to Mr. Laffer.

Paskeville, August 8

Present—Messrs. Pontifex (chair), Goodall, Price, Koch, Palm, MacDonald, Norris, Wehr, Westphale, Meier, and O'Grady (Hon. Sec.), and a number of visitors.

Field Trial Society.—Delegates reported that it had been arranged to hold a field trial of harvesting machinery on the society's land near Paskeville, about the end of November or beginning of December.

Fertilisers.—Members decided to purchase their fertilisers this year in one parcel in order to secure the best terms. A committee was appointed to obtain quotations from the leading vendors.

Social Gathering.—After conclusion of formal business a social was held to commemorate the completion of the eleventh year of the branch's existence. A very pleasant evening was spent by the members and their friends, a large number of visitors being present.

Balaklava, August 8.

Present—Messrs. Manley (chair), Anderson, Baker, Neville, Reid, Robinson, Smith, Thompson, Thomas, Vivian, and Black (Hon. Sec.).

Argentine Wheat.—The Hon. Secretary tabled samples of Argentine wheat, and it was stated that two farmers in the neighbourhood had sown considerable areas with this wheat with the intention of exporting the produce.

Early Feed for Stock.—Mr. Thompson initiated a discussion on this subject; he tabled samples of white mustard 2 ft. to 3 ft. in height, grown on land under hay last year. On some land he drilled in 10 lb. of seed per acre, but this was far too thick; where only 2 lb. was sown the results were very satisfactory. No manure was applied. He had been successful with peas sown on fallow land about the end of May; 1 bushel of seed and 100 lb. of manure per acre being applied with the drill. Mr. Anderson always put in some crop on the fallow for early feed, manuring the land well. He found mustard more suitable for sheep than for cows, as it tainted the milk, but he did not think there was any danger of it becoming a nuisance in their fields. Mr. Robinson worked up this year with the scarifier 140 acres of last year's hay land, and sowed Cape barley at rate of ¾-bushel per acre without any manure; the result was very satisfactory. Members were unanimous that farmers in this district should sow a mixture of mustard, barley, and rape on land under hay crop the previous year to provide feed for their sheep; in another paddock barley should be sown for horses and cows.

Willunga, August 1.

Present—Messrs. Pengilly (chair), Blacker, Richards, Atkinson, J. and W. Binney, Malpas, Vaudrey, Brown, J. A. Hughes (Hon. Sec.), and one visitor.

Malting Barley.—Mr. W. J. Blacker, M.P., read a paper on this subject:—They all knew that the old system of farming was a thing of the past, and that in order to ensure success the land must be thoroughly cultivated, and well manured, and that a system of rotation of crops must be adopted, and that grazing, dairying, pig-feeding, and the other adjuncts so necessary to good farming must be combined with it. Wheat, wool, and dairy produce are the most staple products of the farm for the simple reason that there is a constant demand for them in the markets of the world, and they should therefore try in every possible way to produce only the very best. In addition to these products, however, there were many others which can be successfully grown, and which are absolutely required, both for home use, and also to a certain extent for export when opportunity offers. During the last twenty years farmers, as a rule, have unfortunately, in his opinion, gone in most extensively for cutting a very large proportion of their crop for hay, which generally has only a local market, and consequently the prices are very low. It was only when drought existed in the other States that there was any chance of obtaining remunerative prices. This system of haygrowing had a tendency to induce bad cultivation and slovenly farming, no trouble being taken to secure good seed or prevent bunt and smut. Then, again, they really had all their eggs in one basket, because everything is swept off the land, and the farmer kept neither feed for stock the next year, nor had he straw or grain for bedding and feeding pigs, poultry, &c., whereas if only a quarter of the area cultivated were cut each year for hay and the remainder left for wheat, barley, oats, &c., the price of the hay for sale would be considerably increased, and the full market price obtained for the cereals, which often can be more readily turned into cash than hay, besides having sufficient refuse grain for their pigs and poultry. Wheat certainly should take first place, but malting barley, in his opinion, should come second, as a considerable quantity is required locally for malting and other purposes, the bulk of which has to be imported. There were difficulties to contend with in the growing, harvesting, and disposing of it, but still when such a large quantity is required they should endeavour in every possible way to secure the bulk of the trade for themselves. They had plenty of land suitable for its growth, yet the imports for Australia for the twelve months ending June 30, 1903, amounted to 1,280,344 bushels, and the local production to only 279,840 bushels. Victoria imported nearly two-thirds of the above total, and New South Wales about one-fifth. South Australian imports amounted to nearly 17,000 bushels. When they considered the fact that in addition to freight there is a duty of 1/6 per cental, or 9d. per bushel, to pay, they would surely admit that they should retain a far larger proportion of this trade than they are now doing. In trying to secure this it was important to find out why the maltsters give the preference to the imported article as against locally grown barley, as undoubtedly they do and in many cases unfairly so, as has been pointed out repeatedly by the press of the various States. The chief objection seems to be in the harvesting, which is generally by the ordinary stripper, the maltsters complaining that it is thereby cracked and skinned, so much so that it prevents them from turning it profitably into a good sample of malt. If the Californians can overcome this difficulty, they should also be able to do so. and he believed it would be by substituting the twinebinder for the stripper, and threshing either by the header or by the flail, or the old-fashioned roller which was in use some 25 or 30 years ago. Those who intend giving barley growing a trial should commence with a small quantity, say 20 or 25 acres, or even less; select light, sandy, or red loamy land, with a clay subsoil; fallow the land and keep it clean and free from weeds by the occasional use of the cultivator, or by keeping it well fed down with sheep, or better still by the use of both cultivator and sheep. Immediately after the wheat and other crops are sown commence with the barley; this should be some time between the middle of May and the end of June. Select fine dry weather for sowing, prepare a good seed bed by thorough cultivation, and then drill in about 1 cwt. of manure and 1½ to 2 bushels per acre of good clean seed. The seed should be well pickled as a preventative of smut. Every care must be taken in the harvesting to prevent the grain from being skinned; it should be carefully winnowed, and all small and lean grains removed; these can be used with advantage as pig feed. A good malting sample, which should meet with a ready sale at a fair price, could thus be secured. The straw could be utilized with very great advantage for feeding and bedding stock in winter, and thus be returned to the land as manure. Considerable discussion followed. About 25 bushels per acre was considered a fair average crop in this district, the price averaging 3/ to 3/3 per bushel in Adelaide. Chevalier was the popular variety, but the new Hanna barley was well liked, and would probably be largely grown Cutting with the binder and heading or threshing was considered preferable to stripping for malting barley, but was considerably more expensive. Members thought, however, that the value of the sheaved straw would probably balance this extra expense. Thick sowing—not less than 1½ bushels per acre—was generally favoured.

Elbow Hill, August 5.

Present—Messrs. H. Dunn (chair), J. and W. Ward, Pike, Harvey, Rehn, Spence, Hay, P. and E. Elleway, Wake, G. C. Dunn (Hon. Sec.), and six visitors.

Farm Management.—Mr. Hay read a paper on "Farm and Homestead." The selection of the farm was of vital importance, but the purchaser's finances must govern the size and value of the farm. Where possible the land should be close to the market, or with facilities for reaching the market available. A heavy burden of interest should be avoided, and it was better to pay interest on a small farm of good quality than on a large area of inferior land in a district of uncertain rainfall. The homestead should be as nearly as possible in the centre of the holding for convenience of working, but the most important point was access to the water supply. It was a mistake to build too small a homestead, but unnecessary expenditure should be avoided. The outbuildings should be substantial and lofty; stone walls were preferable, and the cheapest in the long run, as they are permanent, and there was no danger from fire. The stable should be built so that the feed can be put in from the back of the mangers, and the hayshed should be in convenient position to the stables. All implements should be kept under cover when not in use, and be cleaned and oiled before being put away. The pigsties should be large, with good wood or cement floors, and well drained. Fences should be of a substantial character; split posts were preferable to round ones. Good gates should be provided; if iron gates cannot be afforded any handy man could make timber gates at a cost of a few shillings. The paddocks should be divided into convenient sizes for working, and if possible be sheep-proof. No more horses than actually required should be kept. A few dairy cows are necessary, also pigs and fowls. Only good stock should be kept, and these well attended to. He would, as far as possible, only crop fallow land. The fallowing should be finished as soon as possible after seeding to allow the winter rains to soak into the lower soil. Any loss of feed through early fallowing was more than compensated by the extra crop. The fallow should be kept well worked up to hay harvest if spring rains are experienced; while the surface remains dry it was waste of time and labour to cultivate. Weeds should be kept down by sheep, and the soil kept as clean as possible up to seed time. Shade for stock should be provided; if there is no natural shelter in the paddocks sugar gums or other suitable trees should be planted in the corners of each.

Clearing Scrub Land.--The Chairman initiated a discussion on this subject. It was doubtful which method was best, to cut the scrub with the axe or to roll it with the scrub roller drawn by bullocks. The former method, in average scrub land, would cost about 10/ per acre. Cutting will cost about 7/, and picking up and burning about 3/ per acre. The expense of rolling is somewhat more. Cutting ahead of the roller will cost 4/, picking up and burning 3/, cutting the stumps, clearing up the undergrowth, &c., will take a man one day to deal with an acre, then there was the keep of the bullocks. He estimated that it would take three weeks to roll 100 acres, and allowed £3 for feeding and watering 20 bullocks during this time; that 14 weeks will be occupied in cleaning up, which, at 25/ per week (15/ wages and 10/ for keep) would amount to £17 10/, or a total of £55 10/. Members considered the estimate of logging and rolling too high, and also that in cutting with the axe the stumps would require recutting, thereby adding to the cost. Members also thought that more use might be made of the horses for rolling down scrub in the slack seasons.

Wilmington, August 5.

Present Messrs. Lauterbach (chair) Bischof, Zimmerman, Schuppan, Bauer, Payne (Hon. Sec.), and four honorary members.

Forestry.—Mr. Bischof initiated a discussion on this subject. He did not think they were doing as much as should be done to replenish their forest reserves. Unless systematic planting on a large scale was undertaken in the near future their forests would be depleted of the redgum, one of their best timbers. He believed the removal of so much timber from their cultivated lands had caused a material decrease of the rainfall, and belts of trees should be planted in suitable localities. Mr. Robertson said he had travelled a lot in Australia, and doubted very much whether the presence of timber had as much to do with the rainfall as many of the members imagined. It was resolved that the Department of Agriculture be requested to ask the Conservator of Forests whether some provision cannot be made in leases of forest lands for grazing purposes by which the young trees can be protected.

Rolling Barb Wire.—Mr. F. H. Lehmann, of Richman's Creek branch, showed model of an invention for rolling up barb wire from old fences, and for paying out new wire when erecting fences. The model came in for very favourable comment, and a vote of thanks was accorded to Mr. Lehmann.

Question Box.--A number of questions were asked, the answers being to the following effect:—It was generally thought that for the dry areas the progeny of a draught mare and a well-bred blood stallion would prove the most enduring and useful. Over exertion, and sometimes even galloping, will cause a horse to slip its shoulders. It was considered that generally three to five weeks elapsed from date of calving to the cow coming into season again. It was agreed that it was easily possible to improve the strain of farm poultry, both for egg production and for table purposes. The Durham or Shorthorn milking strain was considered the most profitable cow for farmers. To improve the meetings of the bureau each member should take an active interest in the work by preparing papers and taking full part in the discussions.

Mount Bryan East, August 8.

Present—Messrs. Dunstan (chair), Honan, Teddy, Thomas, Pohlner, Taylor, T., J., and E. Wilks (Hon. Sec.), and five visitors.

Wheat Malting.—Mr. J. Wilks had sown wheat on land of a light limestone nature, which had been ploughed up after lying out for nine years; seed was sown soon after ploughing. He would like to know why this should have been the case. [Malting is caused by the presence of sufficient moisture in the soil to start germination, but not to bring the plant through.—Ed.]

Sorghum.—Mr. Thomas wished to know the best way to sow sorghum, the time to sow, quantity of seed, suitable soil, &c.

Exhibits.—Mr. Pohlner showed very large cabbage and pumpkin grown at Paratoo without irrigation; they were grown on land at the opening of an old sheep yard. Members wished to know why exhibits tabled at previous meeting were not referred to in The Journal. [Owing to necessity for economy it is quite impossible to mention in The Journal all exhibits shown at Bureau meetings. The practice of tabling exhibits of this kind at the meetings, and explaining methods of cultivation is a good one, but unless the report contains something of interest to other branches we cannot always refer to them.—Ed.]

Hawker, August 5.

Present—Messrs. Borgas (chair), O'Loughlin, Fisher, Pumpa, Schuppan, Hirsch, Moller, Iredell, and Smith (Hon. Sec.).

Mules on the Farm.—Discussion was continued from previous meeting. Mr. Iredell read extracts from The Australasian on the subject of mule breeding. In the western and southern State of America the breeding of mules had attained large proportions, and was proving very profitable. The report of the Imperial Horse and Mule Breeding Commission contained many interesting facts. The mules were classed according to the work they were required to perform; mules for sugar plantation, measuring 16 hands or more, and weighing up to 1,400 lb., bring from £20 to £27; mules for cotton plantations are smaller, weighing up to 1,000 lb., and fetching up to £17 10/; railroad mules, of 15.2 to 16.2 hands, must be exceptionally good, and are worth up to £30; for mining purposes they range in height from 14 hands to 16 hands, according to the work required, but must be sturdy, and with heavy bone. Mules are hardier than horses, suffer from very few complaints, require less food and of poorer quality than necessary for horses, live longer, and will do more work. About 12,000 to 13,000 mules are annually required by the Indian Government, and there should be a profitable opening here for Australian enterprise. The Indian Commission, in its report of the requirements of the army, states that a few very good mules have been obtained from Australia, and that the mares for breeding must be large; but defective hocks, straight shoulders, and coarse legs do not render them unfit for mule breeding. It was, however, of the utmost importance to secure a suitable donkey stallion. It was decided to make enquiries re cost of a good Jack, with a view to one being secured by the branch.

Pickling Wheat.—The Hon. Secretary stated that a local farmer had this year sown some wheat which was pickled last season, and the plant was growing better than that from unpickled seed sown at the same time. He would like to know whether it would be beneficial to pickle the seed two or three months before sowing. Mr. Hirsch had sown wheat pickled twelve months previously, and saw no difference in the growth between the plants from this and from newly pickled seed.

Green Fodder.—Mr. Hirsch tabled two bundles of white mustard; one from flooded land was 4 ft. in height, while the other had only the rainfall and was 2 ft. in height. Rape was sown in the mustard and had grown well; he thought it would be more profitable for poultry than was mustard, as they did not care for the latter.

Weed.—Mr. Hirsch tabled specimen of weed which he stated to be a great robber of moisture from the soil; even shortly after rain the soil underneath was dry, and nothing grew near it. The only way to get rid of it was to root it up and burn it; if ploughed under it grew again.

Wilson, August 8.

Present—Messrs. Neal, sen. (chair), Sexton, Ward, Nelson, Neal, jun., and Smith (Hon. Sec.), and two visitors.

Weeds.—The vigorous growth of weeds this season was referred to. The Chairman considered that the seeds had lain for years uninjured owing to insufficient moisture to cause germination; and that the March rains coming when the soil was warm had given them a good start. While the weed known as squash bush has done a lot of injury to the crops, others like the native spinach have been of great value to stock. Mr. Ward had pulled one plant of spinach which weighed 12 lb.; cows are very fond of this plant, and it has a marked effect on the production of milk and butter.

Kapunda, August 1.

Present—Messrs. Shannon (chair), Teagle, Flavel, O'Dea, Peter and Patrick Kerin, Weckert, Pascoe, Byrne, Morris, S. A. and G. Harris (Hon. Sec.).

Cattle Complaint.—Mr. Harris read a paper on this subject. Many cattle had died of late years from the complaint known as "dry bible" or impaction. He did not, however, consider "dry bible" the cause, as he had opened many animals and found the "bible" in good condition. The symptoms, as he had observed them, were as follows —The animal is first noticed in the early mornings as being restless and uneasy, lying down and getting up very frequently, and is evidently "off colour." In a few hours, in severe cases, the jaws get stiff, and they are unable to chew the cud or masticate food; they also lose the power of their legs, lie down, and often die in the night. In milder cases the symptoms are much the same, but develop slower, and there is just a chance of being able to save them. After the third day, if they do not improve, they become rapidly worse, moaning with pain and vainly trying to get on their feet. At this stage the nose is dry and hot and the breathing loud. There is a discharge of watery fluid from the mouth, whilst they exhibit a strong inclination to turn the head round to the shoulder. These are common symptoms, and death is only a question of a few hours when they reach this stage. The period they are ill varies from twenty-four hours to a week. On examining the animals after death the parts found affected were the third stomach and small intestines, all of which were inflamed. The gall is very full and the spleen enlarged. All the other organs appeared perfectly healthy. Most of the animals he had lost had been cows in milk, and the complaint attacks them chiefly in the early summer or autumn. The best remedy that he had used so far was doses of aconite and nux vomica, given alternately up to twenty drops every four hours; if administered at the very first appearance of the complaint many cows would, he believed, be saved. Up to the present time he had never had a proper description of the way other people's animals have been affected, but he would very much like to have one. There are probably several forms of the disease, as there can be no doubt that many have died from "dry bible," but as far as he could judge, few, if any, of his. Mr. Teakle had cattle die from "dry bible," but the treatment mentioned by him at previous meeting was effective in saving a number of cows. The worst time for the complaint was in spring and autumn. Several members mentioned that in cows that had died they had found various foreign substances.

Eudunda, August 10.

Present—Messrs. Weil (chair), E. and J. Pfitzner, Martin, Krummel, Walter, von Bertouch, Kluske, Stange, and Marshall (Hon. Sec.).

Poultry.—Mr. Weil reported on visit paid by members to Mr. J. von Bertouch's poultry farm at Kapunda.

Kale.—Mr. J. von Bertouch stated that he had some kale plants which he had been stripping of their leaves for the past two years. One or two of the plants had now developed heads similar to that of a cauliflower.

Yankalilla, August 7.

Present—Dr. Meikle (chair), Messrs. Crawford, Lovelock, Heggaton, Newbold, Tonkin, Leverington, Putland, Stone, MacMillan (Hon. Sec.), and one visitor.

Forestry.—Mr. R. Lovelock read a paper on the cultivation of timber trees. He quoted statistics showing the enormous annual consumption of timber throughout the world and the rapidity with which the reserves of timber were being drawn upon. The best authorities were agreed that forests were being denuded to such an extent as to bring the time when there will be an actual shortage within measurable distance. Australia was not naturally a heavily timbered country, and as the Conservator of Forests had shown recently in the columns of The Journal of Agriculture that good timber can be profitably grown in many parts of the State, further efforts should be made to encourage the planting of timber trees, and to protect the natural growth of suitable timber trees in their forests. The Government had, by the establishment of forest nurseries, done much to assist persons in planting, and had also done a considerable amount of planting in the forest reserves; but, in his opinion, had done but little to protect the young trees growing naturally on their forest lands. This season being a favourable one for tree-planting, he strongly urged members to take advantage of it, if only in a small way. There was no farmer who could not spare a corner somewhere for a few trees, but planting for the mere sake of planting was waste of time. The trees must be judiciously selected for the object in view, the ground properly prepared, and the young trees well cared for for at least 18 months in order to establish them thoroughly. The climatic conditions of this district were favourable to the growth of most pines, of which the following were to be preferred:—The Remarkable pine, which transplants readily from open beds, and is a fast grower and handy tree; the Aleppo pine was very hardy and a handsome tree; the Maritime pine, which would thrive better near the coast than the others. In planting, care must be taken that the holes dug are large enough to give the roots full spread. A damp, cloudy day should be selected for planting. In exposed situations put in a stake to protect the tree, and keep the ground worked for a space of 2 ft or 3 ft. round the tree. When established, the tree will look after itself, and will beautify the farm, provide shelter for stock, and become a source of profit in the future. Members were of opinion that, under ordinary circumstances, it would not be profitable to grow timber, owing to the length of time that must elapse before there is any return, but that such work might be undertaken by the Government with advantage.

Golden Grove, August 6.

Present -Messrs. Milne (chair), Harper, Ross, Woodhead, Buder, McEwin, Rawlins, Angove, N. J. and A. D. Robertson (Hon. Sec.).

Annual Report.- The Secretary reported 11 meetings held, with average attendance of 10 members. Four papers have been read and discussed, and various samples of products tabled. Mr. S. A. Milne was elected Chairman and Mr. A. D. Robertson re-elected Hon. Secretary.

Conservation of Moisture.—Mr. Angove read a paper on this subject.

Rokewood Apple.—Mr. Buder tabled samples of Rokewood apples perfectly sound and as fresh as if only just picked from the tree. The fruit was of excellent flavour, and its keeping quality of the highest.

Mount Compass, August 8.

Present—Messrs. Jacobs (chair), Hutton, Slater, Jenken, Klauss, F. and H. McKinlay (Hon. Sec.), and one visitor.

Rape.—Mr. Jacobs read from Journal of Agriculture paper written by Professor Towar on the cultivation of rape, and considerable discussion ensued.

Murray Bridge, August 7.

Present—Messrs. Jaensch (chair), W. and H. Schubert, Stacker, Kutzer, Patterson, and Lehmann (Hon. Sec.), and one visitor.

Boring for Water.—Mr. Stacker initiated a discussion on boring for water on farms. He put down a bore to depth of 70 feet on his farm, and had got a supply of very good stock water. The first 30 feet was in stiff clay, and then came 40 feet of sandstone similar to that found on the banks of the Murray. The bore was 4½ in. in diameter, and cost about £5. He had erected a windmill over the bore, and it was now pumping all the water required on the farm without exhausting the supply. Mr. H. Schubert had put down a bore previously, and got a good supply, and to him was due the credit of demonstrating that farmers in this locality could secure a permanent supply of water at a small cost.

Tatiara, August 8.

Present—Messrs. Fisher (chair), Rankine, Bond, Penny, Makin, Killmeir, Hall, Moten, Smith, and Hughes (Hon. Sec.).

Bonedust and Disease.—Mr. Rankine suggested that delegates to Congress should raise the question as to whether diseases could not be introduced to a farm by means of bonedust, as bones came from all parts. He also thought that disease was spread by using bonedust bags as chaff bags. [This is hardly a question to ask at Congress, as it has been proved beyond doubt that bonedust has been responsible for spread of anthrax and other diseases. For this reason the importation of bones or bonedust is only permitted under such conditions as will ensure the destruction of all disease germs. Local bones, of course, do not come under the control of the department; but as in most cases these are steamed for from four hours to six hours before grinding and the State is remarkably free from contagious diseases of stock, there should be very little danger. The wisdom of using old manure bags as chaff bags is certainly very questionable.—Ed.]

Poisoning Rabbits. Mr. Low forwarded paper on this subject. His experience was that rabbits would take phosphorized pollard as readily now as at any time, though many held that it was useless except in the summer time, when the grass was dry. He first dissolved 1½ sticks phosphorus in a small quantity of carbon bisulphide, then mixed it thoroughly with 10 lb. pollard and 1 lb. of sugar, making a stiff paste. He put this out in the usual way by making furrows round burrows and elsewhere, and got as good, if not better, results than at any time during the summer; in fact, he had never seen so many dead rabbits about. He strongly recommended using phosphorized pollard now, making it strong with poison, and very sweet.

Lyndoch, August 6.

Present—Messrs. Kennedy (chair), Kushall, H. and A. Springbett, Zimmermann, Schenke, Warren, Ross, Ren, and Mitchell (Hon. Sec.), and one honorary member.

Draught Stallion.—The Chairman reported that the question of the purchase of a purebred draught stallion had been allowed to drop for the present, owing to want of support on the part of breeders.

Summer Fodders.—Mr. Kennedy read a short paper on this subject.

Guinea Grass.—Members wished to know where they could obtain roots or seeds of guinea grass, which was recently favourably reported on in the newspapers. [Plants are not obtainable here, but Messrs. E. & W. Hackett advertise seed at 3/ per lb. Half a pound of seed would be ample to get to test the suitability of any locality for its growth. Guinea grass will not thrive on dry land.—Ed.]

Pyap, August 5.

Present—Messrs. Rodgers (chair), Robinson, Billet, and S. Holt.

Agricultural Motors.—Members consider the price of these motors beyond the means of the average farmer, though, doubtless, capable of useful work.

Vinegrowing—Considerable discussion on this subject took place. It was agreed that cuttings should be selected from good fruit-bearing branches. Topping has been practised with success on some small holdings. A large number of vines will be treated this year by "ringing." The Chairman advised making a very narrow ring on the less vigorous vines.

Hartley, August 7.

Present—Messrs. W. Brook (chair), Hassam, C. Brook, Reimers, Klenke, Kutzer, and Wundersitz (Hon. Sec.).

Agricultural Motors.—Members ridiculed the idea of using these motors for farm work in South Australia.

Rugging cows.—Members considered that rugging paid, as the cows, instead of seeking shelter, will go on feeding quietly. The rugs should, however, only be used in cold weather. Messrs. Brook tested the yield from one cow that was rugged, and found they got a pound more butter during the week she was so protected than during the week previous, although the weather was not so mild. They considered that working horses should be rugged when left standing unstabled for any length of time during the cold weather.

Exhibits.—Messrs. Brook tabled combination drill and clamp, which was much admired by members, it being a cheap, handy contrivance for the farm; also a drenching bit for drenching cattle and horses.

Horse Complaint.—Members wished to know how to treat horse that often has a difficulty in passing water. [Mr. C. Valentine, Chief Inspector of Stock, advises giving a little sweet spirits of nitre. In chronic cases he would give about 1 oz. in the drinking water about twice a week.—Ed.]

Nantawarra, August 7.

Present—Messrs. Dixon (chair), J. and R. Nicholls, Belling, E. J. and A. F. Herbert, Sleep, Hall, Pridham, Spencer (Hon. Sec.), and three visitors

Agricultural Motors.—Discussion on this subject took place, and while members are fully alive to the possibilities of improvements in agricultural implements the general feeling was that the heavy outlay—viz., about £400—for a 10 horsepower motor practically debarred farmers in this State from using these motors.

Protecting Banks of Dams.—In reply to question as to best means of protecting the banks of dams from erosion by the waves, some members suggested putting long pines tied together in front of the bank to break the force of the waves. Others suggested bags of old chaff placed near the water's edge. [Try planting the face of the bank with couch grass, lucerne, or any other useful plant, which will form a mat of root to protect the bank. Ed.]

Horses' Teeth.—Mr. A. F. Herbert stated that some time ago he had an old horse unable to eat properly, owing to irregularities in the teeth. He had the teeth filed, and was well satisfied that the result was worth the outlay, as the horse could eat long hay now, and was doing better

Forster, August 1.

Present—Messrs. Schenscher (chair), F., R., W., and J. Johns (Hon. Sec.), and three visitors.

Farm Horses.—Discussion on this subject took place, members being in favour of thick-set Clydesdale horses for farm work.

Port Broughton, August 6.

Present—Messrs. Harford (chair), Tonkin, Dolling, Bates, Button, Gardiner, Pattingale, Whittaker, Barclay, and Dalby (Hon. Sec.).

Manures.—The Hon. Secretary read a paper on how, when, and what to manure with. For all farmers putting in 100 acres or more there could be no question that the seed and fertiliser drill must be used to get the best advantage from the manure. The question when to manure was one that depended upon local conditions, and also on the individual's opinions. Some farmers sow the manure in February or March, and broadcast the seed in April or May. This enabled them to get the seed in quickly, when conditions were favourable, and as the manure was not in contact with the seed there was less danger of the seed being injured when there is not sufficient moisture to secure early germination. This practice is not suited to lands liable to drift, as in some places the manure will be blown away, and in other parts it will be buried too deeply. The most general practice was, of course, to sow the seed and manure together, and there was no doubt that, under ordinary circumstances, this was the cheapest and best way. Whatever farmyard manure is available should be carted and spread at the rate of 10 tons to 12 tons per acre. He had known some farmers to tip it in heaps and set fire to it. This was a very wasteful practice, as it would always repay the labour involved in carting and spreading. If stable manure were ploughed under early, and the weeds that grew destroyed, the land would give very much better returns. Even for grazing land the return will amply repay any cost. With commercial fertilisers at present it did not seem to matter what brand they used, the main point being that it contain a good percentage of water soluble phosphate. Considerable discussion followed, members being agreed as to the value of farmyard manure. They also thought that in some soils, at any rate, it would soon be necessary to use a different manure to mineral super, especially where the land is not farmed judiciously.

Mount Gambler, August 8.

Present—Messrs. Dyke (chair), Bodey, Barrows, Wedd, Mitchell, Ruwoldt, Norman, Jun., Williams, Watson, Wilson, and Edwards (Hon. Sec.).

Fruit Pests.—The Hon. Secretary had noticed myriads of small flies in the district lately. He wondered whether any of them were parasites of the codlin moth caterpillars. Mr. Williams referred to the enormous increase in the harlequin fruit bug lately. They seemed to have been breeding all the year round.

Navel-ill.—Mr. T. H. Williams (Inspector of Stock) read the following paper on umbilical septicaemia, or navel-ill, in foals and calves:—Foals and calves are lost every season under conditions which appear to the average owner to be a mystery. Foals, when from a week to three or four weeks old, will be noticed lying about a good deal, rising and following the mother with difficulty, perhaps showing lameness of one or more limbs, while the general appearance is pinched and unthrifty. In a short time some, or all, of the joints are more or less enlarged and inflamed, and the animal is unable to rise. The shoulder and stifle joints may show extensive enlargements, and a viscid fluid may issue from the swellings. Death may occur in from a few hours to a few days, but there is a percentage of cases where the disease may assume a chronic form, and the animal may live on for months, and perhaps recover. Careful post-mortems will reveal the origin of the disease by showing the umbilical vein to be the seat of septic infection. When the mother drops her foal where there is dust or mud the umbilical cord is liable to become contaminated, and micro-organisms to gain an entrance into the umbilical vein, from where they quickly pass into the animal's whole system, setting up septicaemia. Whether the case runs a rapid, slow, or chronic course will mainly depend on what bacteria have entered the system. To obviate the disease probably the better course would be to put mares into cleaner grass paddocks to foal. Should there be any likelihood of the umbilical cord being contaminated it had better be tied off with disinfected thread, and well smeared with tar. A fair number of cases of this nature have occurred in the district from time to time, and have been ascribed to all sorts of causes, even the sire being blamed. Every year the writer is called on to inspect calves affected with dulness, watery eyes, drooping ears, general prostration, arthritis, and enlargement of the joints. This season several calves have died in the district, and others were affected. Examinations disclosed what is commonly known as navel-ill or umbilical septicaemia. As with the foals, so with the calves. Mud, charged with organic life, had contaminated the umbilicus at time of calving, and septic poisoning has followed. The navel was found inflamed and thickened, and foetid blood and pus could be forced out. Cleanliness and care are necessary to prevent this form of sickness and death in our young stock. Cows should not be allowed to calve on or near manure heaps, or in dirty muddy yards, as such localities are fruitful sources of danger, bacteria of all sorts being present in millions. If the calf is taken from the mother for hand feeding, it should not be placed with stronger calves for some days, or in dirty pens or yards; if it is contamination of the tender and susceptible umbilical cord is likely. English veterinary authorities advise tying the navel of the newly born calf and smearing it with tar. They treat the disease by making a cross section into the navel, and thoroughly washing out with disinfectants. In the early stage cases sometimes yield to this treatment. In Ireland the "white scour," which causes the death of thousands of calves every year, is due to umbilical inoculation at time of calving, by an organism which rapidly sets up disease, death occurring in from a few hours to a few days. Fortunately this form of umbilical septicaemia has not broken out in Australia. Considerable discussion followed.

Fodder Plants.—Mr. Williams referred to the fact that at certain stages of growth green sorghum had been proved to contain prussic acid, and this undoubtedly accounted for deaths of stock which occasionally occurs after feeding on immature sorghum. In reply to question, Mr. Edwards advised sowing lucerne at once with barley or some other crop to serve as a protection against frost. Mr. Barrows suggested sowing mustard with the lucerne and feeding it off.

Adulterated Chaff.—Reference was made to the poor quality of much of the chaff sold last year, and to the fact that in many cases considerable quantities of straw had been cut up with the hay.

Swan Reach, August 7.

Present—Messrs. Brecht (chair), Arnold, Baker, Fidge, Hasse, Rowe, Zadow, Harris (Hon. Sec.), and two visitors.

Annual Report.—Ten meetings held during the year, with an average attendance of under seven members. The Hon. Secretary appealed to members to attend more regularly. Messrs. J. L. Baker, F. W. Hecker, and R. J. Harris were elected Chairman, Vice-Chairman, and Hon. Secretary respectively.

Crops.—The Hon. Secretary stated that manure for experimental purposes received from the department was put on in May and the crop already showed a marked improvement on the unmanured land. Red rust was reported to be affecting some of the early-sown crops. Grubs were prevalent in some parts, but were not doing much damage.

Carrieton, August 13.

Present—Messrs. Gleeson (chair), Manning, A. and W. Steinke, Cogan, Harrington, and Bock (Hon. Sec.).

Season.—Members reported that owing to the continuous dry weather experienced lately the crops were not looking well. Stock, however, were in good condition, especially cattle and sheep. Mr. Manning stated that some prime sheep which he sent to Adelaide market the previous week realized 21/ per head.

Cradock, August 1.

Present—Messrs. Paterson (chair), Gillick, Haggerty, Glasson, Solly, Marsh, Iredell, Lindo (Hon. Sec.), and three visitors.

Poison Weeds.—Discussion took place on alleged poisonous properties of Lotus australis. The Hon. Secretary could not agree that the plant was not poisonous as stated by the Department of Agriculture; the symptoms shown by animals affected were quite different to that of bloat or hoven, in which case the paunch was so distended with gas that unless relief is given by tapping or by drenching death soon ensures from rupture, strangulation, suffocation, or acute inflammation. Animals which have partaken of the lotus are not so distended, but show symptoms of poisoning, such as rigid muscles, convulsions, paralysis of the limbs and spinal column, foaming at the mouth, and madness in the final stage. Mr. Paterson stated that one of his neighbours had a large quantity of Euphorbia Drummondii and Lotus australis growing in one of his paddocks in which the cows were grazing. One morning he found a cow unwell, and fearing that possibly the milk might not be good he gave it to his pigs, three of which died in a short time. It was resolved that the Department of Agriculture be asked whether these plants had ever been analysed to see if they contained any poisonous properties, and if not that the department should have such analysis made in order to settle the question as to whether they were poisonous or not. [About 17 years ago the New South Wales Veterinary Surgeon made exhaustive enquiries and experiments into the alleged poisonous qualities of Euphorbia Drummondii. Not only did he feed sheep for from seven to 14 days on the weed without injury, but a large number of stockowners reported that their sheep ate the weed without any evil result and were fond of it. Analyses made by the chemist did not reveal the presence of any distinct poisonous property in the plants. We have no record of any analyses of Lotus australis, but we have authentic reports from various parts that sheep and cattle eat it without any injury; in fact, we have had enquiries as to the wisdom of cultivating it for fodder. Both weeds have unquestionably caused death of stock on numerous occasions, but the evidence is certainly against their being actually poisonous.—Ed.]

Wepowie, August 5.

Present—Messrs. Gray (chair), T. and R. Gale, Fisher, Roberts, Smith, Bishop, Halliday (Hon. Sec.), and four visitors.

Destruction of Rabbits.-Mr. T. Gale read a paper on this subject. He had tried various methods, but found the most effective way to get rid of the rabbits was to dig out the burrows and keep them clear. In rocky land he set traps to catch the rabbits in the burrows and afterwards securely blocked the entrances with rocks. He thought the district councils largely to blame for the prevalence of rabbits in their neglect to enforce the provisions of the Act. Members generally agreed with Mr. Gale. Mr. Bishop thought the best plan with the burrows was to block all but one entrance securely, and then burn a bag sprinkled with sulphur in the latter.

Koolunga, August 6.

Present—Messrs. Butcher (chair), Button, Shipway, Burgess, Pengilly, Palmer, Jose, Buchanan, Butterfield, and Noack (Hon. Sec.).

Blood Circulation.—The Hon. Secretary gave an interesting address on the circulation of the blood, illustrated with diagrams and blackboard illustrations.

Prolific Growth.—Mr. Button tabled plant of Marshall's No. 3 wheat with 115 stalks and from 3 ft. 6 in. to 4 ft. in height. This was a self-sown plant grown in the garden.

Amyton, August 6.

Present—Messrs. Thomas (chair), Miels, J. W. and T. Gum, Wheadon, Hughes, Kelly, J. and A. Gray, Ormiston, Mullet (Hon Sec.), and three visitors.

Farm Implements.—Mr. John Kelly read a paper on the care and housing of farm implements. On getting a new implement always see that the bearings are working smoothly, and that they are kept well oiled, as, if once allowed to run hot, they will not work so well afterwards, and will probably wear quicker. All repairs required should be put in hand as soon as possible after the season's work is finished, so that the implement is ready for use when next required. If put aside, some little detail that requires attention is probably forgotten, and loss of time results. The best time for tiring the wheels of the stripper is directly after harvest, as the wheels are dry and will go tightly together. After attending to the tires it is a good plan to run the wheel in hot boiled oil, for about 15 minutes, and afterwards paint the wood. The nuts should always be kept tightened to prevent wear. If the machine is attended to thus and kept under cover it will last a lifetime. All implements should be painted every second or third year, and should not be unnecessarily exposed to the weather. So far as the implements were concerned it was immaterial whether the shed was made of forks with straw roof or thatched, or stone walls and iron roof. Where drinking water was scarce it was best to have an iron roof and save all the water that came off it. With iron roofs care should be taken to have a space between the wall plate and the roof to allow of ventilation in the summer time. A straw roof is the coolest, but it must be put on thick enough to prevent the rain getting through. Sheds are best built east and west and closed on the north side to protect the implements from the sun and hot winds. They should be built away from the stable and haystack on account of possible danger of loss from fire. The paper was well discussed, members generally agreeing with Mr. Kelly. Several members spoke very highly of the results of hot boiled oil on the wheels of both wagons and buggies. Mr. Joseph Gum has a trough with circular bottom to hold the oil in which to revolve the wheel. Mr. James Gray used a gallon of oil on one wagon with the result that it tightened the tires and kept them so through the summer. Iron roofs were admitted to be much hotter than straw, but the harbour afforded to the sparrows by the straw roofs was a serious objection.

Holder, August 8.

Present—Messrs. Rowe (chair), Blizard, Vaughan, Starr, Rodgers, Jaeschke, Burrows, Stuart, Rossiter, Pickering, and Green (Hon. Sec.).

Vines and Fruit Trees.—In reply to question, Mr. Vaughan stated that heeling in vine cuttings for a month or two before planting was advocated because it was claimed that they would strike better. His experience was that if the vines were not pruned until the sap began to rise, and then the cuttings put in at once they started into growth straight away. He advised the use of bonedust as a manure for orange trees.

Wandearah, August 3.

Present—Messrs. Collins, (chair), W. and R. Roberts, Munday, Davidson, Dick, E. H. and E. J. Eagle (Hon. Sec.).

Ensilage.—A short discussion on this subject took place. Members generally agreed that ensilage was good for cows, but were divided in their opinions as to its value for other stock.

Red Rust.—Mr. Dick tabled samples of Early Para and King's Early Wheat in ear and affected with red rust. Members fear that this indicates the probability of a rusty season.

Narridy, August 8.

Present—Messrs. Smallacombe (chair), Lang, Kelly, Smart, Turner, Freebairn, and Dunsford (Hon. Sec.).

Rugging Cows.—Discussion on this subject took place. Members were agreed that the practice would probably be profitable where dairying was carried on extensively, but the climatic conditions of this district did not admit of dairying on a large scale.

Stockport, August 3.

Present—Messrs. Branson (chair), Stribling, Godfree, Watts, Perry, Hartnett, Megan, and Murray (Hon. Sec.).

Membership.—Regret was expressed at the death of Mr. C. W. Smith, one of the foundation members of the branch, and it was decided to send a letter of condolence to the family.

Farming.—Mr. Branson read a short paper on farming to-day and its advantages. In order to compete in the world's markets farmers must adopt improved methods and implements. Of late years lighter implements have to a large extent replaced the heavy machines formerly used, and these result in quite as good work at less expense for horsefeed and labour. Iron ploughs and scarifiers are replaced with lighter but still strong implements made of steel. While the method of sowing with the seed drill was not a quick one, there was no question but that it was the only way to secure highest returns for their outlay. The question whether the continued use of super would exhaust their lands was one that many farmers had raised, but he thought that so far as their experience went the evidence proved that the more manure was used the better the crops. He thought, too, they were justified in using more manure. If they got such an improvement by using 56 lb. to 84 lb. per acre, it was only reasonable to expect still better returns when they put on 1 cwt. or more. Not only would they get the increased growth in the crop, but they would also get more feed afterwards. Then another question continually confronting them was which was the best way to harvest their crops. He thought the binder could only be used to a profit when hay was high in price. The stripper would get in the crop quicker and cheaper than either binder or harvester, and they could start work earlier than with the latter machine, which, however, he believed did better work in damp weather. Besides, the harvester finished the job of cleaning and bagging straightaway, and with the improvements recently made the farmer can, if he desires, save most of the chaff. Members generally agreed with the writer of the paper.

Reeves' Plains, August 7.

Present—Messrs. Jenkins (chair), George, Hancock, Richter, Arnold, Worfal, Folland, Oliver, McCord, H. W. and W. H. Day (Hon. Sec.), and six visitors.

Increasing the Usefulness of the Branch.—Mr. Jenkins initiated a discussion on the past work of the branch and how to improve in the future. He thought the first step was for members to be more regular and punctual and to bring their friends to the meetings. Then they should have shorter papers and more discussion on them. All members should bring notes on various subjects to bring before the meeting, experiments with manures and seeds should be carried out and results reported at the bureau meetings. Members generally agreed with Mr. Jenkins, and it was decided that it was desirable that the branch should arrange for trials of ploughs, cultivators, harvesters, and other implements in order to give farmers an opportunity of judging for themselves of the respective merits of the new machines now being introduced. Messrs. J. G. Folland, R. Jenkins, and W. H. Day were elected Chairman, Vice-Chairman, and Hon. Secretary respectively.

Colton, August 8

Present—Messrs. Hull (chair), Kleeman, Kenny, Barnes, Shipard, Packer (Hon. Sec.), and one visitor.

Poultry.—A paper on poultry keeping was discussed. The necessity for proper housing of poultry and attention to feeding was referred to. The treatment of sitting hens was dealt with, the feeding of young chickens given, and the qualities of the various breeds described. The members felt that before they could deal with poultry on a commercial scale it was absolutely necessary that there should be assured and regular steam communication with Port Adelaide. Given this, they would need to find out what breeds were most suitable to the west coast, and then there was no doubt much more could be done with poultry than in the past.

Port Elliot, August 15.

Present—Messrs. McLeod (chair), Basham, Brown, Williamson, Gosden, Pannel, Welch, and Hargreaves (Hon. Sec.).

Flax Growing.—A short discussion on this subject took place. Some of the members thought the district was too dry to prepare the flax after growing it, but Mr. Gosden held that if the district was wet enough to grow flax well it was also moist enough for the retting process.

Export of Produce.—Paragraphs from daily press dealing with the growing of raisins and currants at Mildura and the export of perishable products from Australia were read, and considerable discussion on the latter subject ensued.

Manuring.—Mr. Gosden held that the continued use of artificial manures would ruin the land, but other members thought more land was ruined for want of manure than from the use of manure. The growing of peas to enrich the land was advocated by some members. Mr. Welch advocated grazing for a time with sheep after cropping the land for three or four years. The Chairman had found sorrel to grow more strongly on the manured land. A neighbour of his burnt an old log fence four years ago and spread the ashes. Since then the land had been cropped each year and manured, this year the crop looked well where the ashes were applied four years ago, but on the rest of the paddock it was only struggling for existence.

Morgan, August 1.

Present—Messrs. Windebank (chair), Hahn, R. and H. Wohling, Hewitt, Haupt, Hausler, Pope, Plummer (Hon. Sec.), and two visitors.

Pickling Sorghum Seed.—A member wished to know how to pickle sorghum seed to prevent smut.

Sore Shoulders.—Mr. H. Wohling read a paper on sore shoulders in horses. He thought most cases of sore shoulders could be prevented by taking care to have the collar fit properly Sometimes the hames are responsible for the trouble; all hames should have reversible hooks, so that the hook can be shifted up or down to get the pressure on the right place. When he found any of his horses affected he removed the collar and applied dry sulphur to the sore When working the horse again he applied more sulphur. A hard collar was best to use with sore shoulders, but it should have some soft linen sewn on the inside. Even the new collars he preferred to line with linen or calico. Never use the same collar for different horses, even for a short time, as the shape will be affected. He believed in soaking the collar overnight and putting it on while wet, so that it will fit the horse's shoulders. Three of the members stated they had horses particularly liable to sore shoulders; do what they would they could not prevent the trouble. In reply to a question, Mr. Hahn recommended carbonate of soda as a remedy for wind colic. Mr. Hausler cured cramp colic with a dose of bitter aloes.

Longwood (Mylor), August 8.

Present—Messrs. W. Nicholls (chair), T. G. and E. J. Oinn, Mundy, Smith, Bradley, J. Nicholls, Hughes (Hon. Sec.), and 16 visitors.

Planting Fruit Trees.—Mr. T. G. Oinn read a paper on this subject. In this locality he advised selecting the hillslopes for planting; a swampy gully or flat was quite unsuitable, and should be devoted to other purposes. The land should be cleared of timber and scrub before planting. Grub and burn the scrub, and then grub the timber instead of merely cutting it down and grubbing the stumps afterwards. Break the land up with the grubber to 12 in. to 18 in. in depth. If the plough is used go 8 in. to 12 in., but the bottom of the tree holes must be broken a little deeper afterwards. It paid to break the land up well before planting, as the trees did very much better than on shallow worked land. In marking out the ground more trees per acre can be set out if planted on the septuple system, but it was more difficult to lay out the orchard on rough land than with the square system. Trees should be 20 ft. apart; if the ground cannot be broken up first take out large holes, remove about 8 in. of soil, and break up the soil with the grubber. Care should in this case be taken to have the tree planted about 2 in. above the natural level of the soil so that when all the land is broken up it will be nearly level. In very stony soil plant a little lower, otherwise when the stones are removed the soil around will be lower than against the trees. Apply about two handfuls of bonedust in each hole and fork it well into the soil, spread out the roots of the tree, working the soil well into them, fill up with fine earth and press firmly with the foot, then finish by putting on a little more loose soil. If necessary the trees should be carefully staked to prevent injury by wind. Protection against hares and rabbits must also be given, and the best way was to enclose the orchard with wirenetting. Considerable discussion ensued. Mr. Nicholls would not dig the holes for the trees any deeper than the land had been broken up, as there was a danger of the water soaking in and destroying the roots. Opinions were divided on this question, and also on the question of cropping between the young trees, though most of the members favoured the practice until the trees were five years old. Mr. J. Roebuck thought 18 ft. apart on the hill slopes quite sufficient, but most members considered 20 ft not too much. On the wetter soils Mr. Roebuck advised planting the trees on a slight mound to permit of the land being ploughed to them for two or three times. This would leave a shallow furrow for drainage between the trees. This system is largely practised in this district, and is found effective. Mr. Hughes considered it necessary to have good wide headlands round the orchard to give plenty of room for turning.

Maitland, August 1.

Present—Messrs. Moody (chair), Jarrett, Bawden, Lamshed, Treasure, Wilson, Smith, Hill, Bowey (Hon. Sec.), and one visitor.

Binder v. Stripper.—Mr. Hill read a paper on binder and header v. stripper in connection with the provision of supplies of fodder for seasons of drought. Since the earliest days of this State the settlers had experienced severe droughts at varying intervals, and though the drought just passed through was probably the severest since the settlement of Australia there was no question that they must expect droughts again in the future. This being the case it was their duty as farmers and graziers to do their best to provide supplies of food to carry their stock through the dry periods. Mr. Hill described experiences in the early days, both in respect to methods of harvesting and losses experienced through drought. They were unquestionably better off now in that they had machines to cut and gather the crop at a minimum of expense. In the early fifties, when the loose mower and horserake were introduced, his father was farming at Lower Dry Creek, and they adopted the practice of cutting the straw after stripping and stacking it in the paddocks between parallel lines of posts and rails about 10 ft. apart, with openings at each end. The stock could help themselves, and could also get shelter. Any waste made good manure when carted to the yard and rotted. They would find this method a useful one, even now. As regards the complete harvester, he considered it a waster, except on those farms where no stock other than those required to work the land were kept. In his opinion the binder was the most useful and labour-saving machine for harvesting crops. The hay crop can be taken off in the best condition with the least labour with it. A portion of the wheat crop can be bound to be afterwards threshed, and the straw, after stripping, can be cut ready for stacking for future use. In 1896, one of the worst years experienced on the Peninsula as regards water and horsefeed, he had two teams constantly carting water for seven months, with the result that he used up all the feed he had saved and had to buy hay at £6 per ton. The following year, his crops being fair and clean, he cut 100 acres in the dough stage with the binder and threshed it after harvest. He stacked about 70 tons of header straw at an extra cost for labour, twine, &c., of about £20. He found this stack of straw of great value to him later on, and he considered the method adopted the best for their purposes. If necessary the header straw could be chaffed and mixed with green feed and converted into ensilage.

Kadina, August 13.

Present—Messrs. Malcolm (chair), Warren, Johnson, Roberts, Roach, D. and J. W. Taylor (Hon. Sec.), and one visitor.

Forestry.—It was suggested that Mr. Malcolm should read a paper at the Annual Congress on "The Culture of Forest Trees," and that he should advocate the insertion of a clause in all Government leases providing that a certain number of trees should be planted on leased lands every year when suitable conditions for planting are experienced.

Field Trial Society.—Mr. Taylor reported on arrangements for the forthcoming field trial at Paskeville about the end of November. He stated that after very thorough discussion it had been decided by the delegates that no judges should be appointed, farmers being left to form their own conclusions after seeing the work of the different machines.

One Tree Hill, August 6.

Present—Messrs. Bowman (chair), Hogarth, Ifould, Kelly, Smith, Clucas (Hon. Sec.), and four visitors.

Dairying.—Various matters in connection with dairying were discussed. For bulls disposed to get through the fences a short hobble had been found effective, and at the same time it saved trouble in managing the herd. The danger of giving separator milk too freely to calves was referred to by a member who had lost a calf recently from no other reason that he could suggest. Young lucerne should be fed gradually until the cows were used to it, otherwise cases of bloat or hoven would occur. Carbonate of soda was found an effective drench in cases of bloat. The Cape tulip was described by some of the members, but as far as known it does not exist in this district.

Horses.—The subject of the breeding and management of horses was on the programme, and for the first time the question system of discussion was adopted. Mr. Smith, as previously arranged, answered the various questions submitted, and a most interesting discussion resulted. Members were pleased with the success of the new mode of procedure adopted. One of the visitors showed a number of engravings illustrating the various types of horses.

Cherry Gardens, August 11.

Present—Messrs. C. Lewis (chair), J. Lewis, Jacobs, Brumby, Metcalf, Burpee, Paltridge, Hicks, and Ricks (Hon. Sec.).

Bloat.—Considerable discussion took place on bloat in cows. Mr. Jacobs found treating with a tablespoonful of carbonate of soda in a pint of water effective.

Saddleworth, August 21.

Present—Messrs. Frost (chair), Adams, Bee, Benger, T. G. and J. H. Eckermann, Hannaford, Neil. Plant, Coleman (Hon. Sec.), and two visitors.

Manuring Pasture Land.—Mr. Colman reported having drilled different kinds of manure in April into 15 acres of good grass land, which had been fenced and kept unstocked. The effect of the manures was not very marked, nor was there any noticeable difference between the results from the different manures. The season had been favourable, and the grass had grown well on both manured and unmanured land.

Blacksmith's Shop on the Farm.—Mr. Benger read a short paper on this subject. He contended that the smithy was a most useful addition to the farm, being the means of saving both time and money in repairs, tools, and implements. Spare time during the dinner hour and on wet days could be profitably devoted to making S hooks, repairing hame hooks, chains, swings, &c., thus preventing delay when accidents occur while the teams are in work. He advised building a roomy shed about 18 ft. x 15 ft. and building in a forge; portable forges lose too much heat. A 24-in. bellows, anvil, vice, stock and dies, drill, tools, &c., with coal and iron for a year's work on ordinary farms, would cost about £13 in all.

Burra, August 14.

Present—Messrs. Needham (chair), Dawson, Flower, Duldig, Arnold, Goodridge, Scott, and Harvey (Hon. Sec.).

Mangolds.—Mr. Dawson read a paper on growing mangolds:—Under favourable conditions mangolds yield a very heavy crop of succulent, wholesome fodder, which is relished by several classes of stock. It is particularly suitable for dairy cows, and when used in conjunction with fodder of a drier nature provides a large amount of nourishment, whilst at the same time it exerts a medicinal, health-producing influence on the system. It is useless to attempt mangold growing for profit on poor land. Enrich the soil first. A heavy dressing of farmyard manure supplies the chief requirements of this crop so far as plant food is concerned, but it should either be applied some months before seeding time, or else should not be too new. An addition of a small quantity of superphosphate is sometimes recommended; also salt for land that is deficient in that mineral. Cultivation should be deep; six inches or more—preferably more. The land should be worked a considerable time before, and also just prior to sowing. If new land be ploughed, it is too much to expect to get it in a fit condition for sowing directly afterwards. After the crop is up and growing, surface cultivation is beneficial. Weeds must be kept under. It is regretable that a fodder plant so well adapted for using with dry feed should not be available throughout the summer; but under normal conditions in regard to weather and water supply they could not expect to gather a plentiful crop of mangold before the autumn and early winter. As July and August sowings give splendid returns nine or ten months later, it might be supposed that if the seed were sown a few weeks or months earlier, a corresponding earlier maturity would result. The objection to early winter sowing, however, lies in the tendency of early sown plants to go to seed the first spring, thus effectually preventing profitable development, whereas, on land sown in July and August, only a small proportion of the crop will run up prematurely, and these can be pulled without serious loss. Of course much depends on the quality of the seed used. It is necessary for the plants to gain a good hold before the dry season sets in, so that they may be in a fit condition to stand the summer. After they are well established they go through the summer all right, although making but little, if any, growth during the long dry periods. When the first soaking rains come good progress is soon apparent, and increase in weight is rapid. A test of the value of irrigation would certainly be interesting. Mangolds should flourish with a liberal supply of brackish water, such as would kill many kinds of vegetation, as they require a certain quantity of salt to their best development. In an average season, with only the rainfall, they should be able to grow 40 tons of roots per acre in many parts of this district; but in order to do this there must be liberal application of manure and thorough cultivation.

At their last meeting two mangolds, weighing 20 lb. and 32 lb. respectively, were exhibited. It is worth noting that if one of 20 lb. weight be grown to each square yard it represents a yield of rather more than 43 tons per acre. Instead of allowing a yard of land to each plant, however, they may have them a less distance apart, so the roots might average a good deal smaller, and still the crop would go 40 tons to the acre. Two feet apart in the rows is a fair distance after the occasional thinnings. As the seeds are sown in their shells, each of which usually contains more than one seed, it is well to take out all but one plant from each place before much size has been attained. Sow seeds about 6 inches apart in the rows, to allow for possible misses, then thin out to one foot between each plant after they are well up. Then before the dry season sets in pull out every other one again, leaving 2 feet between each.

Appila-Yarrowie, August 7.

Present—Messrs. Francis (chair), Bottrall, Lawson, Wilsdon, Hannagan, Stacey, Canning, Grant, Catford, Klemm, Becker, Daly, and Bauer (Hon. Sec.), and four visitors.

Harvester v. Stripper.—Mr. Grant read a paper on this subject. Probably more attention was being given at the present time to the improvement of agricultural machinery than at any time before. The march of progress undoubtedly leads to great expense to the farmer, as he is compelled to utilize the best and most economical machinery he can secure, and he often finds that he has to purchase new implements before the old ones are half worn out. Probably of all improvements effected, the introduction of the stripper was the greatest stride made at any one time, and now they had in the harvester a still further improvement, as not only was the grain gathered, but also winnowed and bagged at the one operation. The harvester will be seen at its best in a heavy crop, when the work of the stripper is most unpleasant. Some people speak of stripping as being one of the easiest operations in connection with farm work. This may be correct when the ordinary stripper is used, as on the average it can only be worked for a relatively short time each day, but the writer has found stripping with a damp-weather stripper in a 20-bushel crop at the rate of 15 acres a day exceedingly hard work, and often unpleasant. With very light crops he thought the strippers would be used, as it would hardly pay to use the harvester. When using the latter machine the wheatfloor can be selected in the most convenient place, it not being necessary to get it quite level and free from stones, as is the case when the stripper is used. A lot of heavy work is also avoided in the lifting of the grain when the harvester is used. Besides this, it is a great advantage to be able to go right ahead with stripping, cleaning, and bagging with the knowledge that there will be no threshing or winnowing to be done, and that a good sample will be turned out. Another advantage lies in the fact that the grain can be more quickly removed from danger of injury by wet, &c. He did not think, however, that the harvester would replace the stripper altogether, any more than the stringbinder had replaced the ordinary mower; both would be necessary machines on up-to-date farms. His experience with the harvesters had led him to carefully inspect the various machines on the market, and to watch them at work. Some of them were too complicated; others were only in the experimental stage. A few of the main points required in a good harvester were as follows A good strong steel comb, fairly narrow in the teeth, but thick to stand the wear: this is very important on a machine that is expected to strip in damp weather, as it is necessary to have a good speed on the beaters (which also need to be strong); a thick comb will prevent vibration. The peg drum should be within a reasonable distance of the beaters to avoid too long a throw, and be so arranged to prevent any of the strippings falling into the beaters after once getting into the peg drum. The threshing apparatus should be fixed so that it can be thrown partly or right out of operation while the machine is in motion; in this way a lot of cracking of grain can be prevented. All threshing parts of the machine should be driven by belting in case of accidents, using also a belt for the peg drum, independent of the belt used for driving beaters; this will give both belts a better chance of gripping further around the pullies, and they can be worked slacker, thus preventing bearings being drawn so tightly together. The riddles or sieves should be large, and made of galvanised steel with a fore and aft shake to prevent waste; the elevators for raising grain and headings should both be driven by chain belting, and be provided with a large number of cups so as to be driven slowly. The machine should be arranged so that it can be raised or lowered easily and yet have a fair amount of weight on a good substantial front wheel which is a great steadier and guide to the machine on the whole. A box for holding the grain instead of running into sacks while travelling around the field seems to be coming more and more into favour; in rough country the box must be used as the sack platform would catch in obstructions. A good roomy chaffcarrier is a strong recommendation to a machine, and always will be while horsefeed is anything like its present value. The carrier ought to at least carry the chaff coming from two bags of grain in a wheaty crop. An interesting discussion ensued, and Mr. Grant was asked a number of questions concerning the harvester. Some of the members thought that after a year or two's use the machine ran very heavily, but the general opinion was that there would be many improvements effected in the course of a few years.

Loss of Stock.—Mr. Bottrall reported loss of a number of young sheep after a severe attack of scouring. Some members thought this due to the sheep eating the grass while the frost was still on the ground.

Millicent, August 6.

Present—Messrs. McRostie (chair), Stewart, Varcoe, Harris, Oberlander, Campbell, Mutton, Stuckey, Warland, Crouch, Hart, Hutchesson, Holzgrefe, and Davidson (Hon. Sec.).

Business.—It was decided to ask the Department of Agriculture to supply samples of local phosphate rocks. [The department has neither funds nor facilities for supplying samples of this character to all the branches.—Ed.] Mr. Campbell suggested that the branches should combine to secure a number of samples from different parts, as they varied in appearance to a remarkable extent. Further discussion took place on the utilization of potatoes for the manufacture of starch, and for feeding stock.

Ardrossan, August 8.

Present—Messrs. Cane (chair), Morgan, Henderson, Woods, C. and R. Dinham, Alderman, Wilson, and Opie (Hon. Sec.).

Plants.—Mr. Opie read an interesting paper on "A Plant," in which he described how plants were living things, requiring food and water like animals. The struggle for existence amongst plants, their methods of obtaining food and water, fertilisation, &c., were dealt with.

Paint for Ironwork.—In reply to question, members recommended painting the ironwork about a seeddrill with a mixture of kerosine and castor oil to prevent rust.

Davenport, July 21.

Present—Messrs. Trembath (chair), Hodshon, sen., Lecky, McDonald, Magrath, Holdsworth, Welby, Pybus (Hon. Sec.), and one visitor.

Duty of Members.—Mr. Lecky spoke strongly in condemnation of members of the Bureau who fail to keep their engagements in respect to writing papers for the meetings. It was not fair to the other members. Other members agreed that if any member found he could not read a paper when his turn came he should secure a substitute.

Poultry.—Mr. McDonald read an account of the methods under which a very large poultry farm in America was carried on.

Richman's Creek, August 10.

Present—Messrs. Freebairn (chair), Searle, Roberts, Nicholson, McSkiming, Gebert, Mattner, Knauerhase, J. H. and F. H. Lehmann, Kelly (Hon. Sec.), and two visitors.

Improving the Usefulness of the Bureau.—Mr. F. H. Lehmann read a paper on this subject. He thought one of the first things to be done was to alter the constitution to provide for the retirement of a certain proportion of the members each year. New blood was necessary, but unless something of the sort was done there was very little chance of securing new blood, as once appointed a member usually remains a fixture until he dies, removes from the district, or is struck off the roll for non-attendance The public generally, and young men in particular, will not continue to attend meetings when the chances of their ever becoming members are so remote. His suggestion was that one-third of the members should retire annually, but be eligible for re-election if an insufficient number of desirable new members offer. He also thought every branch should have its experimental plot where the suitability of fodder plants, trees, cereals, &c., could be tested side by side under exactly similar conditions. He did not wish to discount the value of the experiments carried out at Roseworthy and elsewhere, but they would all admit that they were of little or no value to the farmers in the northern districts. Having an experiment plot, the bureau should take charge of Arbor Day, appoint a committee to lay out the grounds - to see that everything is ready for the children to plant the trees, and also to attend to them afterwards Most of the members agreed that new blood was wanted on the Bureau, but difference of opinion existed as to the best way to secure this Members thought the proposal for an experimental plot worth adopting if it could be carried out without much expense

Dairying Some discussion took place on question asked by a visitor as to best separator for small dairy of seven or eight cows The Chairman said the Bureau could not recommend one make in preference to another. Members were unable to answer question of which breed of cows was best for this district, as not many cows were kept, and generally the best milkers succumbed during the droughts.

Mount Remarkable, August 6.

Present—Messrs. Challenger (chair), Foote, T P. and G P. Yates, Giles, Kaerger, Morrell, Casley McIntosh, and O'Connell (Hon Sec.).

Butter Factory —The question of starting a butter factory in the district was discussed at length, and arrangements made for holding a public meeting with a view to securing the necessary assistance of the local dairymen.

Boothby, August 11.

Present—Messrs. Foulds (chair), Leonard, T and D. Sims, Chaplin, Bradley, and Turnbull (Hon. Sec).

Horse Breeding —Mr. Leonard read a paper on this subject. He considered farmers did not pay sufficient attention to the breeding of draught stock. As their mares were already on the small size he would advise getting a large, well-shaped stallion, which must be purebred; it was not sufficient that its pedigree be traced back on the sire's side alone. It was better to pay double the fee for the service of a good stallion than to make use of a half-bred. Some people consider heavy draughts unsuitable for farm work; he considered them preferable tc lighter horses; if well made, and not too low set they will travel well and do good work Mongrels may do the work, but more of them will be required, and they cost just as much to feed. If the farmer wants to sell them he finds that he can get very little compared with what a good draught will fetch. Many farmers make the mistake of working their mares until they get old and then breeding from them. Foals from young mares will make far better horses.

Orroroo, August 14.

Present—Messrs. Moody (chair), Lillicrapp, Roberts, Harding, Oppermann, Copley, Robertson, Brown, Jamieson, and Tapscott (Hon. Sec.).

Fallowing.—Mr. S. Roberts read a paper on this subject. While each farmer must be guided by local conditions of soil and climate in his farming operations, he believed that as far as the upper north is concerned a very good system to adopt was to fallow up each year about one-fifth of the wheatgrowing area of the farm; to crop the land two years in succession, and then to let it lay out for not less than two years, fallowing it again the fifth or sixth year. To put all the land intended for cropping under fallow would necessitate keeping more horse stock than required for seeding and harvesting operations, or in other words feeding a certain number of horses that would be idle for nine months out of twelve. Before fallowing he advised grazing the land for a time, as it will firm the soil, which will plough up much better than land not well consolidated. Fallowing should be commenced as soon as the weeds have well started, and should be finished as early as possible. In dry districts deep fallowing was, he thought, a mistake; he had equally good crops from land ploughed 4 in. as from deeper cultivation; the former method takes less horses, and saves wear on harness, &c. Care must be taken to turn the land well to bury the weeds and manure properly; he would leave the surface rough to allow the rain to enter freely, and would keep the fallow clean by grazing with sheep. Cleaning with implements was more expensive, and only destroyed the weeds, whereas sheep converted them into wool and mutton; if the soil is of a loose nature it is particularly important that it should not be disturbed more than necessary until seed time. Members generally approved of the writer's views, but some difference of opinion existed as to whether it was better to keep the fallow clean by means of sheep or with implements.

Penola, August 15.

Present—Messrs. Wilson (chair), Morris, McKay, Peak, Ricketts, Richardson, Storey, and Allnutt (Hon. Sec.).

Location of Branches.—It was resolved that the department be requested to republish in The Journal of Agriculture the table showing the location of the branches, average rainfall, &c., also farm and garden notes as in the past.

Port Germein, August 8.

Present—Messrs. Blesing (chair), Deer, Kingscombe, Harvey, Stone, Thomas, Mortess, Holman, Smith, Head, and Gluyas (Hon. Sec.).

Bloat or Hoven.—Mr. Head read a paper on the treatment of "blown" stock. He stated that in one instance 80 sheep which were blown through eating marshmallow were saved by the owner, who promptly applied coaltar to their tongues. He had used this remedy himself with satisfactory results. Mr. Deer had saved affected cattle by forcing a stick into their mouths

Gladstone, August 15.

Present—Messrs. Sargent (chair), Rundle, Gallasch, Brayly, Wornum, Tunbridge, Smith, Greig, Smallacombe, and Goode (Hon. Sec.).

Annual Report.—Five meetings only held during the year, with an average attendance of 7.4 members. This was considered very unsatisfactory by the members. [Few will dispute this conclusion.—Ed.] Messrs. J. Sargent, C. Goode, and W. A. Wornum were elected Chairman, Vice-Chairman, and Hon. Secretary respectively for ensuing year.

Field Trials.—A committee was appointed to consider the advisableness of arranging for field trials of various agricultural implements under the auspieces of the branch.

Strathalbyn, August 17.

Present—Messrs. M. Rankine (chair), McAnaney, Tucker, Meikle, Cockburn, Butler, Blake, W. M. Rankine, Watt, Sissons, Mules, and Cheriton (Hon. Sec.).

Farming.—Mr. H. H. Butler read a paper on "How to work an average farm of 500 acres and the most profitable stock to keep." Quality of soil and climatic conditions must, of course, govern the working operations, but he would deal with land under local conditions. The first thing to be considered was how many irons to have in the fire; he would strongly advise the farmer to develop as many different sources of income as possible. Not more than 200 acres should be cropped in any season, and of this quite two-thirds should be fallow land well worked, especially after spring and summer rains. Fertilisers must of necessity be applied; he would recommend that the farmyard manure be utilized for manuring pasture land or for early green feed. He found barley the best cereal to grow for green feed, as stock, especially cows, are fond of it, and he believed it gave better results than other cereals. Working on the above lines six good horses well fed will be sufficient; not more than 10 cows should be kept, and for these he liked the crossbred Jersey-Shorthorn, breeding from good milking shorthorn cows. Two or three breeding sows (Berkshires) should be kept, and he preferred crossing with the Poland-China boar. If feed is scarce sell the progeny as weaners; otherwise keep for porkers or baconers. Without sheep he considered a farm of 500 acres mismanaged; about 100, principally breeding ewes, could be kept the year round. Large-framed merino ewes should be mated with Down or Dorset Horn rams, and the lambs sold. Poultry should be kept, and will prove a good source of revenue if properly managed. He preferred the Wyandotte and Leghorn breeds.

Standard Weight for Chaff.—A long discussion on this subject took place, and a motion was carried favouring the adoption of 40 lb. net, as the standard weight for bag of chaff.

Whyte-Yarcowie, August 15.

Present—Messrs. Hack (chair), Hatherly, Mudge, Kornetzky, Dowd, McLeod, Francis, Faul, Hunt, Boerke (Hon. Sec.), and one visitor.

The Wheat Plant.—Mr. Boerke read a paper on this subject, dealing with the origin, development, and general characteristics of the different varieties of wheat grown for commercial purposes.

Hay v. Wheat.—Members wished to know whether a hay crop exhausts the land more than a wheat crop. [This is a point that, so far as I know, has never been definitely settled by careful experiment. Many farmers hold that a wheat crop will take more out of the land than a hay crop; that the reverse is the case is very doubtful.—Ed.]

Morphett Vale, August 18.

Present—Messrs. Bain (chair), Christie, Hutchison, McLeod, Depledge, Pocock, Perry, Holly, Forsyth, and Anderson (Hon. Sec.).

Cape Tulip.—Mr. Depledge showed plant of this weed. Members were unanimous that every precaution should be taken to prevent it from spreading to this district.

Farm Economy.—Paper read by Mr. Cornish at Stansbury Branch was well discussed. Members considered the paper well written and worthy of the attention of members of other branches. Members also expressed their appreciation of The Journal of Agriculture, and thought that more notice should be taken by members of branches of practical papers read at other branch meetings. They thought if this were done it would not only encourage the writers, but work up more interest in the work of the Bureau.

Inkerman, August 4.

Present—Messrs. C. H. Daniel (chair), Board, Smart, Sampson, Lomman, Kennedy, Fraser, Mugford, C. E. Daniel (Hon. Sec.), and two visitors.

Agricultural Motors.—A short discussion on this subject took place, members being of opinion that they would be unsuitable for small farms, and on stumpy or sandy land.

Lampas.—Discussion took place on this subject. Several members considered burning the only sure cure; others condemned this treatment as gross cruelty, pricking, or lancing, and rubbing with salt being considered effective. Messrs. Board and Fraser considered that "lampas" was often to a great extent mere fancy. At certain periods of the year, and especially with young horses, the roof of the mouth hung rather low, but they never heard of the complaint with horses in good condition. Members would be glad to know how to treat horses suffering from lampas. [Usually a course of soft food, following a slight purgative, will be sufficient, but in severe cases the bar may be lanced, cutting across the bar, but avoiding the middle. Burning is both cruel and unnecessary.—Ed.]

Horses' Teeth.—Considerable discussion took place on the advantage of the practice now becoming common of having the teeth of old horses filed or otherwise treated. Some members spoke favourably of the results, others were dubious of the practice.

Warts on Stock.—In reply to question, Mr. Sampson said he found caustic a certain cure for warts on a horse's nose. [It is stated that the daily application of castor oil to warts on stock will quickly remove them. Care must be exercised in the use of caustic.—Ed.]

Caltowie, August 3.

Present—Messrs. Hewitt (chair), Kerr, Graham, Petatz, Jettner, Royal, Potter, J. and A. McCallum, McDonald, Neate, J. G. and F. Lehmann (Hon. Sec.), and six visitors.

Care of Horses and Implements.—Mr. Lehmann read a paper on this subject. Never give the horses more feed than they will eat; it was better to give a little at first, and then more afterwards if required. This applies especially to the morning feed, when they usually eat nearly twice as much as at other times. The stable should be divided into at least three yards, so that the horses that agree can be together. Unless this is done where there are a dozen or more horses it will be found that some of them are not getting a fair share of the food. If they are given much long hay at a time the horses will only pick out the heads, leaving the stems in the manger. It was a mistake to stable feed the horses directly after harvest, as if done the animals will hang about the homestead instead of looking for their feed in the paddocks. In wet weather they must, of course, be fed, as if allowed on the stubble when the ground is soft they will spoil a lot of food. When necessary to feed them after harvest they may be given as much cocky chaff as hay chaff, and will do well on it. Cows with regular milking and feeding, especially in the cold, wet weather, should return the farmer £10 per head per annum. Sheep were necessary, but it was very bad policy to keep more than can be well fed. At prices of late years it has paid well in this district to fatten sheep for market. Sheep require water every day in the hot weather, and if they are to be fattened care must be taken that they get it regularly. Where a farmer can keep 300 to 400 sheep it will pay him to breed 60 to 70 lambs each year. All implements and machinery consisting partly of wood should be housed when not in use. The sheds should be closed on three sides; some farmers say it pays better to buy new implements than go to the expense of building sheds and repairing implements when they get out of order. His experience, however, was that if painted occasionally and looked after properly they did not have many repairs to pay for. He had a stripper still in good, sound condition after 30 years' use. Discussion ensued, members agreeing with the writer. Mr. Kerr stated that he found it paid him better to keep a larger number of sheep for short periods than by keeping what the farm can carry the year through. He thought farmers in this locality should go in more for dealing in sheep.

Mundoora, August 7.

Present—Messrs. Harris (chair), Angley, Beck, Shearer, Mildren, Mitchell, Button, Owens, Gardiner (Hon. Sec.), and one visitor.

Short-weight Manure.—Members are pleased to note that other branches are awaking to the loss sustained by farmers accepting 10 bags of manure as a ton. In future members of this branch and many farmers as well intend to require the agent from whom they purchase to pass every bag over the scales, and they will only pay for the actual weight received. The members hope similar action will be taken throughout the farming districts, and contend that, inasmuch as they have to sell all their wheat over the scales, they are warranted in requiring manure to be similarly treated.

Poultry.—Mr. Beck stated that his fowls had been laying well, and this he attributed partly to the fact that he gave them for breakfast boiled wheat as hot as they will eat it. Mr. Button found his hens liked young green wheat chaffed; he also recommended giving a warm breakfast where possible.

Pickling Seed Wheat.—Mr. Harris pickles in a cask, dividing each bag of wheat into two branbags, and putting them in the pickle for a few minutes; then takes them out, and allows the pickle to drain off. The Hon. Secretary also adopts this method, which he finds easy and simple. Mr. Owens stated that a neighbour has a small cemented tank, in which he pickles a bag of seed at a time; but members could not see that this was any better than pickling in a cask, as in most cases the bag of seed must be divided for convenience in handling. Mr. Angley pickles on a cement floor. Mr. Mitchell considers it advisable in all cases to let several days elapse before sowing the seed that has been pickled.

Treeplanting.—On the suggestion of Mr. Mildren it was agreed to ask the local council to permit the branch to plant trees along the main road, and also to assist in the undertaking.

Gawler River, August 9.

Present—Messrs. Parker (chair), Winckel, Roediger, Hillier, Leak, Bray (Hon. Sec.), and one visitor.

Fencing.—Mr. A. M. Dawkins forwarded a paper on this subject. It was important that the farm should be well fenced, both to keep in the stock and to protect the crops against stock. A farmer must be guided in his selection of posts for fencing by the timber of his locality. Only mature wood should be used; trees can be too old, in which case the wood will be full of dry rot, or "carroty." The best matured wood would stand for 50 years or more. He had taken up pine posts, which, after being in the ground for 33 years, were still in passable condition. On the other hand, immature wood, limbs and watershoots from old stumps, will only last a few years. Good matured peppermint gum is very durable, but the supply is limited. In purchasing, always avoid any post that is light and corky; choose heavy, solid, close-grained wood. The redgum post is now most readily secured; the best have a fine wavy grain, and are heavy and durable; they are practically proof against white ants. The bluegum makes a fair post, but will not stand where white ants are prevalent. Generally 6-ft. posts are required, but no hard and fast rule can be laid down, as in good, solid ground the posts need not be set in the ground so deeply as in loose marl or sand. In setting the posts, always sight from the sight stick in front; looking back over the line of fence may result in a slight error which will throw the fence a long way out. All strainers should be set six inches deeper than ordinary posts, and the corners a foot deeper. He had seen so many fences spoilt for want of a good strut that he was inclined to look upon the strut as one of the most important features in the fence. The strut should be quite as good as the average post, and a good block of wood must be put behind it. Let the strut into the post just above the second wire. A fair fence for cattle can be made with three wires, but four are better. For sheep six wires, the top being barbed, is the usual number, but he thought three plain and two barbed wires make a better fence. The space between the three top wires would be more than usual, but the sheep have a great respect for the barbs and will not get through.

For cattle, also, two barbed wires are better than only one, as with the single wire they will put their heads through the fence. In putting in barbed wire many plans are adopted, including stapling, tying back with wire, or cutting a slot with a saw, but none of these got the wire in the middle of the post, except where only the top wire is barbed. He found the best plan of all was to bore holes 1½ in. in the centre of the post, then run a piece of plain wire right through, attach the barbed wire with a small neat knot, and with a horse draw the plain wire through the line of fence and with it the barbed wire. When the fence is erected, it is important that the wires be kept tight, as there will be less risk of the stock getting out or injuring themselves, and the fences will last longer. Considerable discussion ensued. Members generally considered posts 5 ft. 6 in. long sufficient. They should be set 18 in. to 20 in. in the ground. Strains should be not more than five chains in length. Mr. Roediger favoured No. 6 wire for cattle, but considered No. 8 strong enough for sheep. Where mixed stock are kept the lower wires could be No. 8 and the top wires No. 6. Members differed as to merits of different wire strainers, generally favouring those they were accustomed to use.

Riverton, August 8.

Present—Messrs. A. J. Davis (chair), J. W. and J. E. Kelly, H. A. and W. B. Davis, Gravestocks, Nash, Calf, Hussey (Hon. Sec.), and one visitor.

Breeding Draught Horses.—Mr. J. E. Kelly read a paper on the breeding and management of draught horses. Notwithstanding the farmer's instinctive love for horses, it could not be denied that he had devoted less intelligence and attention to the breeding of draught horses than to the perfection of other classes of stock. He looked upon the breeding of draught horses as a source of income much neglected. Really good animals are scarce, and will at all times command remunerative prices, and in view of the few that are available the present high rates would assuredly maintain for many years. While good draughts were difficult to secure at any price, inferior animals will realize next to nothing, and are, unfortunately, only too common. Why this deterioration in their stock? Is it because the farmers in the past have been tempted by high prices to sell their best mares, or is it because the stallions used are inferior? He was afraid it was in many cases a little of both; certainly a number of stallions that in the past had travelled the district should never have been allowed to do so. He strongly advocated a licence fee of £15 to £20 per annum on all stallions travelling for hire in order to stop these inferior animals. A well-bred, strong, compact draught horse will do more work and eat far less food than the slab-sided, hairy-legged beast which was so common. Considerable difference of opinion existed as to best time to break in a young horse. Although a little light work at 2½ years old would not hurt a horse, he preferred to wait till they were 3 years old. He thought it a mistake to leave the colts until 4 or 5 years old, as, although for heavy teams a horse at this age even cannot as a rule do justice to himself, on the farm there was always light work that could be done by the young horses. When first broken in they must be taken great care of to prevent straining and other injuries. It was a good plan to bath the shoulders occasionally with brine, as it will toughen the skin and render the shoulders less liable to become sore. He was sorry to say it, but he thought that as a rule farmers do not keep the stable as clean and tidy as they should do. Most of them would agree with him that the stables should be cleaned out every day for the sake of the animals alone. They had all noticed, and some probably wondered why so often the horses' legs are puffed and swollen In his opinion it was largely due to want of cleanliness. He believed that where the farmer could not spare the time to superintend the looking after the horses and stable himself it would pay him well to give a good man extra pay and make him responsible. He should see that the stable and horses are regularly and properly attended to, and that the harness is kept in good order and oiled when required. In feeding it was a great mistake to give them a lot of food at once; it was better to give two or three smaller feeds, as the horses will do better, and there will be no waste of chaff, &c., thrown out of the manger. The horses should all be thoroughly cleaned down before they go to work each day. It was a great mistake to allow the horses to drink freely when knocking off work, unless they are cool and not overheated or sweated. This practice was, he thought, often the cause of losses. Members agreed that too much attention could not be given to the feeding and care of mares and young stock, and that the stables should be kept clean and sweet. Grooming regularly also found favour on the ground that horses well groomed would eat less food and thrive better. Mr. H. A. Davis allowed his horses to go to water when let free; they soon learn to know when they had sufficient, and would not injure themselves by taking too much when overheated. Mr. W. Davis advised leaving the bit in the mouth when letting the horse drink, as it would prevent it from taking water too freely. Mr. Nash found bathing the shoulders of young horses with a weak kerosine emulsion a good practice, as it kept them clean, and also had a tendency to harden them; it should be washed off before the collar is put on.

Angaston, August 8.

Present—Messrs. Snell (chair), Player, Smith, Thorn, Sibley, Friend, Heggie, A. and F. Salter, Vaughan, Matthews (Hon. Sec.), and three visitors.

Annual Report.—Thirteen ordinary and three special meetings held during the year, with an average attendance of nine members. A number of interesting papers had been read, and a successful conference of branches arranged. Messrs. J. H. Snell and E. S. Matthews were re-elected Chairman and Hon. Secretary respectively.

Rugging Cows.—Members fully realize the benefit of rugging cows during the cold weather, and the practice is becoming general in the district.

Grafting Vines.—In reply to question, Mr. S. O. Smith advised grafting vines about the last week in September, or when the shoots had reached 1½ in. to 2 in. in length.

Capillarity and Osmosis.—Mr. Snell read a paper on this subject, describing the movements of liquids in the soil and in plants, and illustrating his remarks by some demonstrations of an interesting character.

Lucindale, August 22.

Present—Messrs. E. Feuerheerdt (chair), B. A. Feuerheerdt, McInnes, Matheson, Beaton, Dow, Tavender, Carmichael, Dutton (Hon. Sec.), and one visitor.

Peach Aphis.—Mr. B. A. Feuerheerdt warned members of the necessity for keeping a close watch for peach aphis. This pest must be treated at the earliest appearance, as it increased so rapidly that the trees would soon be swarming with the insects.

Co-operation.—Mr. Tavender read a paper on this subject as applied to local conditions. Their district, comparatively isolated as it is, offers a splendid field for putting into practice the theory of co-operation in a storekeeping and agency company. If each household within a certain radius, say about 70 altogether, were to take an average share of £30, a capital of £2,100 would be raised. This amount he considered sufficient to carry on the company, as large stocks need not be kept, because members would order a long time before delivery, so that purchases could be made in large parcels. With this capital a store at Lucindale could be purchased and a manager appointed, with three directors to look after the interests of the shareholders. One director would retire every year, which would allow each director to hold office for three years. This means an election each year, so that shareholders could exercise control over the business annually. Quarterly meetings would be sufficient for directors, and annual meetings for shareholders. The whole of the supplies required could be purchased in large parcels on special terms for every item required. The purchase of shearing and farming supplies, machinery, vehicles, wire, building materials, &c., could all be made wholesale or imported. Shearers and other labourers could be booked for engagement or contracted with. The benefits to be derived in buying as well as in selling or handling produce or stock were numerous. The shipping of wool from the district would be done to the growers' advantage if the whole of it were open for competition by the rival shipping firms; sales could be made to one firm in London or elsewhere in different brands on their respective merits. Skins sent away in large parcels but in numbered bundles. Wheat, oats, &c., if in large lots would bring better prices. With regard to the sale of stock a lot of the present unnecessary expense could be saved by having the list of all stock for sale at the one place and a fixed time for inspection, so that the buyers need only make one trip, and all come about the same time. To give an idea as to what may be done in this direction he quoted the following paragraph from The Leader:—"At the annual meeting of the Federated Butter Factories' Association the Chairman congratulated the shareholders on the successful result of the year's operations, which had resulted in a net profit of £2,548. He said the co-operative system of marketing their produce had proved an unqualified success." There seemed to him no doubt that such a concern would pay; the storekeeper makes his business pay with probably about one-quarter of the trade that would be done by the co-operative company. After paying for the extra cost in conducting the larger business, he considered that the profits on one-half the business at present done in the district would be distributed in the shape of interest or dividends to the shareholders.

Crystal Brook, August 8.

Present—Messrs. R. Pavy (chair), G. and G. M. Davidson, B. and M. Weston, Hutchison, Dabinett, Morrish, Venning, A. and W. Hamlyn, P. Pavy, Miell, Townsend, Symons (Hon. Sec.), and three visitors.

Country Life.—Mr. Symons read a paper on this subject, dealing with the crowding of the greater part of the population of the country in and around a few of the principal towns. He attributed the trend of population to the towns to the fact that people making a living off the land had to work harder and put up with greater hardships than in the city, besides which, there were the difficulties which meet the young man who desires to secure land at prices which will permit him to work it profitably. There had been a considerable emigration to other parts where more inducements were offered to settlers, and the only remedy he could see was the compulsory purchase of the large estates in districts with reliable rainfall to be cut up and offered under reasonable conditions.

DATES OF MEETINGS OF BRANCHES OF THE AGRICULTURAL BUREAU.

With a view of publishing in the "Journal" the dates of meetings of the branches of the Agricultural Bureau, Hon. Secretaries are requested to forward dates of their next meetings in time for publication.

Branch.	Date of Meeting.		Branch.	Date of Meeting.	
	1903	1903.		1903.	1903.
Balaklava	Sept. 19	Oct. 10	Naracoorte	Sept. 5	Oct. 10
Booleroo Centre	1	6	Narridy	19	—
Bowhill	5	—	Norton's Summit	4	2
Brinkworth	4	2	Onetree Hill	3	1
Burra	18	9	Orroroo	18	16
Bute	11	3	Paskeville	5	—
Cherry Gardens	8	13	Penola	5	10
Clare	4	2	Pine Forest	1	6
Clarendon	4	—	Port Broughton	3	1
Colton	—	3	Port Elliot	19	17
Crystal Brook	5	—	Port Lincoln	18	16
Elbow Hill	1	6	Port Pirie	4	3
Eudunda	7	5	Pyap	2	7
Finniss	7	5	Quorn	5	—
Forest Range	3	1	Red Hill	1	6
Gawler River	4	2 & 30	Reeves Plains	4	2
Hartley	4	—	Rhine Villa	4	2 & 30
Inkerman	1	6	Riverton	5	3
Johnsburg	5	3	Saddleworth	18	—
Kanmantoo	4	2	Stansbury	5	3
Kapunda	5	3	Stockport	7	—
Kingston	5	3	Strathalbyn	21	19
Koolunga	3	1	Virginia	7	5
Lyndoch	3	—	Wandearah	7	5
Maitland	5	3	Watervale	—	5
Mallala	7	5	Wepowie	2	—
Mannum	19	17	Whyte Yarcowie	19	17
Minlaton	26	24	Willunga	5	3
Morgan	5	3	Wilmington	2	7
Mount Compass	12	10	Wilson	5	-
Mount Remarkable	13	1	Woodside	7	—
Nantawarra	2	7	Yankalilla	4	2

VENTILATION OF FACTORIES AND WORKROOMS.

CONTRIBUTED BY THE CHIEF INSPECTOR OF FACTORIES.

(Abstract continued from page 68.)

As the conditions in the rooms of different factories and workshops vary very greatly, and the most suitable and economical means for obtaining satisfactory ventilation vary correspondingly, so that any uniform system of ventilation for all is out of the question, we have thought it most useful to give in the following pages a general account of the different ways in which fresh air is, or may be, introduced, and of the conditions which modify the effects produced.

NATURAL VENTILATION WITHOUT SPECIAL OPENINGS.

In all rooms a certain amount of exchange of air occurs through the walls, roof, floor, and various chinks, as was originally proved by Pettenkofer. He showed experimentally that when all visible chinks were closed in a room investigated by him the rate of ventilation was only diminished by 28 per cent., as compared with the rate when the windows and doors were only closed in the ordinary way. How free the passage of air may be is shown by the fact that when in a small room there is still a brisk draught up the chimney after the door and window are tightly closed. Thus in a room of 1,400 cubic ft. used for some of the experiments described below the chimney draught was 4,450 cubic ft. per hour, so that this amount of air was entering through the walls, &c.

[Two pages of the original matter are here omitted.]

NATURAL VENTILATION THROUGH SPECIAL OPENINGS

Where special openings for ventilation of workshops and factories are used these are in the great majority of cases open windows. As a general rule this seems to be the most practical arrangement in ordinary buildings. Where permanent openings such as ventilation shafts are also provided, we have frequently observed that these are either totally insufficient in number or size, or have been blocked up in cold or windy weather, and left in this condition. It is evident that where windows are used for natural ventilation they require constant regulation, as their action is entirely dependent on the varying influence of wind and differences of temperature between inside and outside. Not only must the extent be varied to which any particular window, or set of windows, is opened, but often it is necessary to close those facing in one direction, and open those on the other side. The most suitable arrangement of windows varies so much in different kinds of rooms that it is impossible to lay down rules on the subject. The windows should, however, always open at as high a point as possible with a view both to avoidance of draughts, and to allowing of the more ready escape of the heated air from lights and persons. Windows so arranged that the incoming air can be directed upwards are advantageous in winter, but should when possible be capable of being opened as freely in summer as ordinary sliding sashes. The free opening of windows in summer is an enormous advantage.

Where open windows are used as outlets, it not infrequently happens that a staircase, or the shaft of a lift, is the principal inlet. If the air thus entering has been more or less warmed by passing through a basement or ground floor room which is heated in winter, this arrangement is successful; but often enough, as already pointed out, the foul air from one flat is allowed to pass up into the next, so that the incoming air for the higher flat is far too impure.

The opening and closing of windows ought not to be left solely in the hands of ordinary workpeople, but a foreman or other person in each room should be made responsible for having enough of windows open to keep the air fresh without causing inconvenience from cold and draughts, and for seeing to the proper regulation of the heating arrangements. The freshness of the air can best be judged of on entering the room from the outside air; and for the regulation of temperature a thermometer should be used.

In very wide rooms, sheds, &c., ventilation is usually carried out by means of special ventilators or shafts in the roof, often supplemented by Tobin tubes or other inlet openings. Where ventilation is mainly dependent on this plan it is essential that the openings should be sufficient in number and cross section to perform their work even on still and warm days. Roughly speaking, a greater velocity than 200 ft. per minute up a ventilating shaft cannot usually be counted on, even with free entrance of air to the room. A cylindrical shaft of 1 ft. in diameter has an area of nearly 0.8 cubic ft., and will, therefore, carry off about 200 x 60 x 8 = 9,600 cubic ft. of air per hour. Hence, to give a ventilation of about 2,000 cubic ft. per person per hour one such outlet ventilator would be needed for every five persons, or one square foot of free outlet shaft for every six persons, together with corresponding inlet provision. We have observed that the provision of ventilating shafts is frequently quite insufficient. Often, too, the shafts are so obstructed by various elaborate contrivances above, or in the course of the shaft, that they are of very little use except in windy weather, when they are least needed, as natural ventilation by other means is then at its maximum. It is unfortunate that ventilation is frequently regarded from a qualitative rather than a quantitative aspect. Arrangements, which are well designed with a view to prevention of draughts in cold weather, or to utilizing the effects of wind, are often quite insufficient to give the necessary quantity of air in warm or still weather, so that unless windows are freely opened the ventilation may be very bad. If the ventilators are designed so as only to give sufficient air in cold or windy weather, they will not give nearly enough in still weather; and if they give enough in still and warm weather they will usually cause draughts in cold and windy weather unless they are partially closed. The truth is that natural ventilation, whether by shafts, &c., or by open windows, needs constant regulation and attention; and in factories and workshops employers should make such arrangements that not only are sufficient means of ventilation provided for all weathers, but that some one person is definitely responsible for their regulation in each room. From what we have observed we are convinced that under these conditions it is easy enough, where a room is not crowded, to keep the air fresh, and consequently well within the carbonic acid limit recommended by the committee, and that no hardship would be imposed on employers by this limit, provided the regulation were interpreted in a reasonable spirit, and with due regard to the difficulty of avoiding occasional mistakes.

The more crowded a room is the less easy does it become to secure adequate supply and distribution of air without the use of fans. A great deal will, however, depend on the adequacy of the heating arrangements, the situation of the windows or other openings, and the possibility of using them for ventilation without causing intolerable draughts. In cases where, after due notice of inadequate ventilation has been given, the air is not kept within the proposed limits of purity, we are very decidedly of the opinion that the employer can be fairly called upon to provide adequate mechanical or other ventilation, with the inlets and outlets so arranged as to avoid draughts, or else to reduce the number of persons employed in the room.

(To be continued.)

INDUSTRY.

SUPPLIED BY THE DEPARTMENT OF INDUSTRY.

Labor Bureau.

Number of persons registered and found employment by Government Departments and Private Employers from July 27 to August 27, 1903.

Trade or Calling.	Number Registered.		Number Employed.
	Town.	Country.	
Laborers and youths	75	50	276
Carpenters	10	1	4
Masons and Bricklayers	1	—	3
Painters	5	—	—
Blacksmiths and strikers	5	—	—
Fitters and turners	5	—	5
Moulders	1	—	—
Enginedrivers	—	1	—
Patternmakers	—	—	1
Plumbers and ironworkers	4	1	1
Compositors	2	—	—
Messenger	—	—	1
Boatman	—	—	1
Apprentices	17	—	1
Cleaners	8	2	—
Porters and junior porters	9	1	—
Rivet boys	5	—	1
Totals	147	56	294

August 27, 1903. A. Richardson, Bureau Clerk.

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AN EXAMINATION OF TORRENS RIVER SILT.

By Arthur J. Perkins, Secretary for Agriculture.

It is a matter of common knowledge that the city authorities are much troubled by the vast amount of silt that accumulates not far from the Torrens Lake Weir. Its removal is no easy matter, and in present circumstances the complete silting up of Adelaide's artificial sheet of water appears to be within no immeasurable distance. It had been suggested to me that possibly the silt might have some value as a manure, in which case the disposal and sale of it might contribute somewhat towards the cost of its removal. In this connection, therefore, I forwarded samples of the silt for analysis to the School of Mines.

Samples illustrating two accumulations of silt were taken; one represented older deposits, the other the more recent and higher deposits. Mr. Chapman's results are given in the table below:—

TABLE I.

Fertilising Ingredients in River Torrens Silt expressed as Percentages of the Silt dried to 105° C.

	New Bank.	Old Bank.
	per cent.	per cent.
Total nitrogen	0·181	0·136
Total phosphoric acid	0·119	0·064
Potassium oxide (in strong H. Cl.)	0·820	0·720
Phosphoric acid (soluble in 1 per cent. citric acid) ...	0·022	0·016
Potassium oxide (soluble in 1 per cent. citric acid) ...	0·025	0·024
Organic carbon	1·950	1·460
Humus (approximation)	4·333	3·244
Relation $\frac{\text{Organic carbon}}{\text{Nitrogen}}$	10·77	10·74

Unfortunately the analyses have not come up to expectations, and the data in the table show clearly that for all practical purposes the Torrens River silt has no value as a manure. The proportion of comparatively inert matter is so great as to remove all commercial value from what fertilising substances the silt may contain. At best, the silt may be described as a good rich soil, and those alone requiring anything of this description, who are able to bear the cost of its removal, can turn it to any advantage.

NOTES ON THE RINGING OF THE CURRANT VINE.

By Arthur J. Perkins, Secretary for Agriculture.

Towards the end of this month and the beginning of the next the periodical "ringing" of the unfortunate currant vine that has latterly come into vogue will come into full swing. In this connection the thoughtful paper read by Mr. Fulton Salter, at the Angaston Bureau meeting, and published in full elsewhere, deserves more than passing notice. In clear and concise terms he expresses what is the outcome of his own personal experience of "ringing," and of his observations of what has befallen others who have availed themselves of this practice. Whilst he raises many points that are of interest to the currant grower, it is only too apparent that his mind is dominated by the fear that the disadvantages that in his experience attach to ringing may not be balanced by its apparent advantages. "Of what avail are two or three successive heavy yields, if in the end the operation destroy plants that are infinitely more costly to bring into bearing than ordinary vines?" is the impression his paper must leave on the mind of the reader, although he may not have gone to the length of putting it into words. In effect, he says that his personal experience points to a considerable weakening of the plants under the influence of this operation; there is a considerable reduction in the wood-producing power of the plants. This experience of his he finds confirmed, and in some cases amplified by that of others; some growers, in fact, contemplate desisting in their murderous attempts on the goose that laid the golden eggs, and will "ring" no longer. Well, this general weakening of the plants was inevitable, and on more than one occasion have I had occasion to refer to it as a necessary consequence of ringing; as far back, I believe, as in 1892, when addressing for the first time the Clare Agricultural Bureau. If my memory serves me aright, the Greeks who have grown and rung currants before us do not reckon on more than 15 crops from their vineyards. It is certainly unfortunate that we should have had to make our first acquaintance with the operation on giant vines, planted 20 and 30 ft. apart, on whose early profitless years, and on the costly trellis work that supports them, much money may appear to have been thrown away in vain; it seems probable, too, that such plants must necessarily both suffer more acutely and succumb earlier than the smaller and less developed Greek vines. And if Mr. Salter's suggestion that old currant vineyards should be systematically renewed by intermediate layers implies that the new vines should be built up on the same ample lines as their declining parents, I feel compelled to demur.

Let us face the position. It seems probable that "ringing" is an operation that has come to stay, not because of caprice, but because of its influence on the currant grower's finances. What, in effect, has been our experience in the past? It is but rarely that a currant vineyard yielded anything worth picking prior to its eighth year, and subsequently to this period, crops were generally both irregular and unsatisfactory. Planting and eight years' cultivation without returns, may fairly be represented with accumulated interest by £30 an acre; add to this from £10 to £15 for the expensive trellis work that has been found necessary. Under the old conditions, therefore, without taking into consideration the value of the bare land, the currant grower had on an average to face an outlay of £40 to £45 per acre before he could count on much return. To my mind ringing will enable us to overcome much of this expense and delay; instead of 20 to 30 ft. vines will not be planted at more than 9 to 10 ft. apart, the trellis work need not cost at the outside more than £4 to £5, and by ringing them in their third year they should soon enter into the profit-yielding bearing stage. Granted that our present unrung giant vines will outlive several generations of them; but what of that, if in the meanwhile everything considered the latter prove more profitable to the grower than the former?

So much for the future, for the new vineyards that I hope to see rapidly coming into existence; the question cannot, however, be left at this point; we cannot possibly overlook the present in the fate of the only type of currant vine of which we are possessed. It goes without saying that such vines will need careful nursing, with a view to putting off as far as possible their premature disappearance. I cannot believe on present evidence that wisdom lies in the direction of the proposed complete abandonment of "ringing," but rather, as has been very well pointed out by Mr. Salter, in the adoption of methods and practices which may tend to modify and reduce the inevitable weakness It appears evident that a simple incision of the bark will be less weakening in its ultimate effects upon the removal of a ring a quarter of an inch in width, such as I have occasionally seen. Personally I have never recommended that the width of the ring should exceed one-eighth of an inch, and I am prepared to substitute for it the simple incision, which, I believe, has been advocated by Mr. Grasby, if it can be definitely shown that its weakening effect is sufficient to bring about a satisfactory setting of the fruit. Mr. Salter suggests that the incision should be protected from the rays of the sun by a piece of rag, with a view to favouring the healing process. This suggestion I consider in every sense rational and worthy of adoption, and I might add that it might be worth while trying the effect of ordinary grafting wax on the exposed tissues. It is possible that the reduction of evaporation that will result may afford a more rapid and satisfactory healing, and thus tend to reduce the weakening action of the operation.

Mr. Salter has also pointed out that the ringing of the rods might be substituted for what is usually practised on the stem. I am inclined to think that so far as the setting of the fruit is concerned the results will prove equally satisfactory; whether the weakening effect on the plant will be reduced is another question. I imagine that it would, but I have nothing beyond inference to guide me in this decision. It is certain, however, that the wood on the spurs that had not been rung would be far more satisfactory. In its modified form, however, the operation could not, of course, be conducted quite as expeditiously, and it should be borne in mind that where the rods had been rung would always prove a weak spot, which, when weighted down with fruit, severe gales of wind would have no difficulty in finding. On the whole, however, I incline to the belief that ringing the rods of our large currant vines is worthy of a trial as a substitute for the somewhat unsatisfactory ringing of the stems.

Lastly, it may be urged that where as a result of the severe, and occasionally perhaps injudicious, ringing of past years, the growth is manifestly unsatisfactory, it would be wiser to omit ringing for the present season, even at the expense of a possible reduction in yield. Mr. Salter's advice as to thorough cultivation, coupled with the manuring of currant vineyards subjected to the strain of ringing, cannot be too strongly recommended.

I have no intention of discussing again what appears to be the most probable physiological action of this "surgical operation," but I cannot help raising a protest against Mr. Salter's statement that owing to the fact that the backward flow of the sap is cut off by the incision the vine is flooded with sap above it, with the result of a heavy setting of fruit It is so much a matter of common experience that when a vine is flooded with sap it tends to wood and not to fruit, that such a statement carries its own refutation on the face of it.

In connection with this same question I have had various queries addressed me by the Holder Branch, some of which will find answer in the remarks that have already been made. It has been asked, inter alia, whether in localities where the Zantes are irrigated, the closer planting which I have advocated in ordinary circumstances is likely to hold good. It can only be answered, in the absence of direct experiment, that this is a matter that the irrigation colonies should test for themselves. In ordinary circumstances the heat and added moisture of irrigated districts result in growth that is more exuberant than what obtains elsewhere, perhaps the weakening effect of ringing may be lessened; perhaps the vines may still be continued on present generous lines; it is all a matter of conjecture from this end, and can only be satisfactorily settled by those immediately concerned. Personally, however, were I planting a new vineyard on the Murray, I should be disposed to test closer planting. Should it prove unsatisfactory, intervening vines can readily be grubbed out.

WHEN TO SPRAY FOR CODLIN MOTH.

By Geo. Quinn, Horticultural Instructor.

With October and the setting of the fruits upon apple and pear trees in this State the codlin moth begins its season of active depredation. Before the petals begin to fall from these trees, growers would be acting wisely to have their appliances well tested and ready, so that no hitch or delay will occur when the serious work of spraying begins.

From the results of hatching experiments, carried out for several years in the open air, we know the first moths begin to emerge outdoors here in October. On the plains around Adelaide the first moths were found in the breeding cages during the first week in October. No actual data is to hand yet, but in the damp, cool ranges it would most likely be several weeks later. I would suggest some of our growers in each district place a few cocoons in which the winter larvae in an undisturbed condition are enwrapped, into small boxes to hatch. A good breeding cage may be made by removing the sides from a common cigar box and replacing them with fine muslin gauze. These should be hung in the apple trees. By such an experiment the exact time of the emergence of the first moths in each locality could be determined. The results would furnish an index of when to begin spraying, besides the intense interest always attachable to such an exploration into the realms of natural history. The moths, for which our first sprayings are applied, have developed from the caterpillars which passed the winter in a dormant condition hidden away in crevices and bark of fruit trees, stakes, posts, fruit cases, and anywhere else the insect may have secured a safe refuge when it quitted the fruits at the end of the previous season. I say at the end, because those caterpillars which leave the fruits before midsummer here in South Australia almost invariably pass through their pupal stages and emerge as moths again before the summer ends.

The first spraying should be given when the young fruits are just formed and the second nine or ten days later. Growers will require to watch the different varieties carefully, as some set their fruits much earlier than others, and must, therefore, be sprayed first. This, of course, applies only to the first and second sprayings The object of the sprayer should be to drive the spray into the calyx cup before it closes. Later sprayings should be made at intervals 14 days for the third spraying, and about 20 days between the later operations The grower must endeavour to keep the fruits coated all over with the spray compound. With the later maturing varieties it will pay well to keep on spraying until the end of February; last year's departmental tests demonstrated very plainly that a mistake had been made in ceasing operations too early.

In connection with this season's spraying I would urge growers to note one or two points In the first place if Kedzie's formula for making arsenite of lime be followed—and at present we know nothing affording superior results—at least 6 lb. of fresh, lumpy, quicklime should be used in each 40 gallons of spray. There is a current notion among fruitgrowers that as the arsenite of soda compound is a clear solution, the complete spray, when milk of lime had been added, is a solution also, and therefore needs no stirring when being applied. This is not correct, as the compound of arsenic and lime is practically insoluble, and, although not so heavy or so liable to settle rapidly to the bottom of the spray tank as Paris green, it must be kept constantly stirred if the most uniform results are to be obtained. The best agitating action is one which has a rotary or semi-rotary movement. Thirdly, the arsenite of soda and the milk of lime should be compounded several hours before being sprayed upon the trees. Further, as the arsenic and lime combine much more rapidly with the aid of heat, it would be well to pour the arsenite of soda into the liquefied lime while it is still fairly hot in the slaking. Care would be necessary to remove the coarse sediment first, otherwise a proportion of the arsenite might be wasted in the after straining. Although up to the present the results from its use have not been too encouraging, theoretically there is no reason why the white arsenic should not be boiled up directly with the fresh lime.

Those growers who have not received a copy of the report on our spraying tests carried out last year should apply to the Department of Agriculture for it, as it is available for free distribution.

SWINE FEVER.

The fact that during the past year, prior to the discovery of swine fever in Victoria, a number of pigs were imported into the south-east from the neighbouring State, has caused the local stock inspector to keep a very close watch on the piggeries in his district. On the 12th September Mr. Stock Inspector Williams reported the discovery of several cases of what he believed to be swine fever at Glenbournie and Tantanoola, in the south-east, and further cases have since developed on other farms. It was recognised that should Mr. Williams's diagnosis prove correct, we were faced with a very serious problem, and immediate action was taken by the department to as far as possible prevent any movement of pigs from the infested areas. Fortunately, the so-called 90-Mile Desert isolates the south-east from the rest of the State, and this fact greatly simplifies the work of the department.

The whole of the counties of Grey, Robe, and MacDonnell has been proclaimed a quarantine area, and the removal or travelling of swine by any person within the quarantine area, except with the written consent of the Inspector of stock, is absolutely prohibited.

In order to prevent the spread of the disease the following regulations have been gazetted:—

SWINE FEVER REGULATIONS.

Destruction of Diseased Swine.

1. All diseased swine or swine showing symptoms of disease shall be destroyed on the premises where they are kept, and the premises where such diseased swine were kept shall be thoroughly disinfected by the owner under the supervision or to the satisfaction of an inspector of stock.

Killing of Contacts.

2. All swine which are or have been in contact with diseased swine shall be killed, and the carcases of any such contacts which are not affected with swine fever may be disposed of for the benefit of the owner, provided that an inspector of stock has first certified in writing that such carcase is not affected with swine fever.

Disinfection of Premises, Sheds, &c.

3. Any inspector of stock may from time to time require every place where any swine are or have been kept, or to which they may have had access, as well as all vehicles in which swine have been conveyed, or articles with which they have come in contact, to be thoroughly cleansed and disinfected to his satisfaction or under his supervision.

Diseased Swine.

4. Any owner having any swine affected with disease shall give immediate notice to the nearest inspector, and shall not offer for sale any diseased swine, and shall take all necessary action to prevent disease from spreading by destroying diseased swine and disinfecting swine which have been in contact, also sties, premises, sheds, and yards, and such measures as an inspector of stock shall direct.

Penalties.

5. Any person who shall commit or attempt to commit, or be concerned in committing or attempting to commit, a breach or violation of or shall neglect to comply with any of the foregoing regulations shall for every such offence, upon conviction thereof, be liable to a penalty of not less than five pounds nor more than one hundred pounds, or to be imprisoned (with or without hard labour) for any term not exceeding 12 months.

The Chief Inspector of Stock and Veterinary-Surgeon Desmond visited the south-east, and, in company with Mr. Williams, made a careful examination of the suspected animals. They entertain no doubt whatever that the complaint is swine fever, but hope that the strict enforcement of the above regulations will confine the disease to piggeries already found infected.

THE COLLEGE LAMBS.

By J. D. Towar, Principal Agricultural College

For several years the College has been breeding lambs for the early market, using Dorset Horn and Shropshire sires. The ewes employed were originally high-grade merinos, but gradually their number has been increased by the better first-cross Dorset ewes, until at the last breeding season a few over half of the breeding flock were Dorset-merinos.

These Dorset-merino ewes are fine, big sheep, many of the better specimens weighing up to 200 ℔ They are excellent mothers, breeding earlier than the merinos, giving a much larger percentage of twins, and seeming to give an abundant flow of milk. Their large frames and strong, healthy constitution were, no doubt, accountable for the very small losses of both ewes and lambs in the lambing season., and the magnificent growth the lambs make during the first four months of their existence.

The 162 ewes used last season were divided for breeding as follows:—

30 merinos to the merino ram.
6 Romney Marsh, 21 Dorset-merino, and 17 merinos, to the Shropshire ram.
54 Dorset-merino and 34 merino to 2 Dorset Horn rams.

The result of these matings was 158 strong, healthy lambs. Owing to the mixing in of a few lambs of other breeding, largely Shropshire, the exact number from each cross was not determined. The rams were all placed with the ewes on December 4, but both the Dorset rams and Dorset ewes proved the earlier breeders. Lambs from the ewes bred to Dorset Horn rams appeared fully three weeks before the Shropshire or merino lambs, while the first lambs from the Shropshire ram were dropped by the Dorset ewes. This advantage of three weeks thus gained by the Dorsets kept them ahead of the Shropshires throughout the season, although the Shropshires seemed to grow the faster and gave promise of overtaking the Dorsets in a short time.

On September 7 the lambs were selected and weighed for the Adelaide Show.

5 Dorsets weighed 524 ℔., averaging 104.8 ℔. each.
5 Shropshires weighed 484 ℔., averaging 96.8 ℔. each.
5 merinos weighed 428 ℔., averaging 85.6 ℔. each.
10 Dorsets for export weighed 961 ℔., averaging 96.1 ℔. each.
10 Shropshires for export weighed 877 ℔., averaging 87.7 ℔. each.

The five Dorsets won the second prize in their class, being beaten for first by pen of Shropshires, much heavier and evidently older. The winners in the export class were a very even lot, no heavier than either of the College exhibits, but evidently better selected for freezing and export. There was no competition in the merino class.

These lambs were sold at auction on the Exhibition Grounds, as follows:—

5 Dorsets, at 19/.
5 Shropshires, at 17/.
5 merinos at 17/.
10 Dorsets, at 16/.
10 Shropshires, at 15/6.

The 10 Dorsets were bought for freezing, and gave an average dressed weight of 43 ℔.

On October 16 we exhibited and sold on the Gawler Showgrounds a pen of each breed, as follows:—

5 Dorsets, at 19/.
5 Shropshires, at 15/6.
5 merinos at 13/9.

In the Adelaide market on September 23 we sold 42 Dorsets at 18/4, and 8 Shropshires at 16/1, the lot of 50 averaging 92½ ℔. on the College weighbridge. It should be remembered that 20 lambs of the best of each breed had been sold before these were drafted, and that these were prices obtained in the open market. It may be interesting to know that these Dorset lambs were bought by Mr. S. S. Ralli, who has presented the College with two Shropshire rams for breeding purposes, and that he proposes to keep them until they are two-year-olds, allowing them to run with some grade Shropshires, to determine the relative value of the two breeds as mature sheep. We shall, by way of experiment, keep a few wether lambs of each breed until they are four-tooths, keeping weights of wool at each shearing, and note the growth from time to time.

An experiment aiming to compare the raising of lambs with feeding store sheep has already begun One hundred sheep, 50 ewes and 50 wethers, well woolled, though in store condition, were recently purchased, at 13/6 per head. The ewes will be shorn and bred to one of the coarse-woolled rams, probably the Dorset. The wethers, when fat, will be sold, and 50 more bought with the money. Separate accounts will be kept throughout, and the experiment will be continued as long as it proves of interest and value.

It is certain that with present prices it pays to raise early lambs. Which breed to employ cannot be determined by the above figures. The Dorsets have each year come two or three weeks earlier, and with that advantage have each time excelled the Shropshires in the early market. Yet it has been commonly observed that the Shropshires made the faster growth, nearly overtaking the Dorsets by the time the latter were four months old. The young Dorsets are handsome specimens, and have invariably commanded the higher price in the saleyard.

ROSEWORTHY AGRICULTURAL COLLEGE NOTES.

FARM.

BY J D. TOWAR, PRINCIPAL AGRICULTURAL COLLEGE.

Fallowing in Nottle's, No. 5, and Ebsary's fields is completed, and the harrows are busy subduing weeds and keeping the earth mulch intact. The weather conditions have been generally favourable, the rains coming with a regularity that has permitted continual working of the plough. By far the greater part of the ploughing was done with the four-furrow disc plough, using eight horses in two "four-abreast" teams. This plough turns 32 inches at one passing, and averages four to four and a half acres a day. A three-furrow stumpjumper, a two-furrow, and several single-furrow ploughs were also used in the work, thereby giving experience to the students, but the disc plough does far the best work, and was kept going practically every day.

Filling the silo was begun on September 22, using a portion of barley from Dahlitz, the first cutting of lucerne from the seeding made May 13, and the stackyard patches in Flett's and The Island, which were badly infested with weeds.

The College crops are coming on splendidly, and the indications are that we will begin haying by October 10. The oats, the oats and wheat, and the cross-drilled All King's wheat are about equally advanced, and it is difficult to say which will be ready for the binder first. The seedings of rape made in portions of the several fallowed fields are making satisfactory progress, and it is reasonable to hope that a good growth will follow.

A Tamworth sow has been added to the College swine herd. She will be bred to the Berkshire boar to produce bacon pigs in comparison with the pure breeds.

This year the College will use a Southdown ram for the production of fat lambs The third prize four-tooth ram of the Melbourne Show, bred by Messrs Hogarth, of Tasmania, has been bought for this purpose.

Mr. S. S. Ralli has kindly presented the College with another fine young Shropshire ram, Mr John Melrose has given us a three-year-old purebred Dorset Horn ram, and with a good young merino recently purchased of Mr. John Murray we start in this year with entirely new sires for the flock. We hope to breed from about 300 ewes.

EXPORT OF EGGS—AN EXPLANATION.

Under the above heading in our September issue Mr. D. F. Laurie wrote as follows:—"The information as to values of our exports of poultry and eggs published in this Journal has proved attractive, and several contemporaries have annexed it. Some particulars were placarded at the Dog and Poultry Show recently, and The Journal was not given its due. As may be remembered, these figures were courteously supplied by the Collector of Customs in response to my request—last year's figures were thus obtained by the editor of The Journal of Agriculture and incorporated in my pamphlet. It is as well to be explicit in these days of literary piracy."

Mr. W. C. Grasby points out that portion at least of the above paragraph can only refer to him. It appears that with a view to showing what selection and careful breeding can do towards improving our ordinary poultry, he exhibited at the recent poultry show a pen of crossbred birds bred by himself. On this pen and in various conspicuous positions of the showgrounds, he posted placards showing that in 1902, amongst our staple exports eggs and poultry occupied the eighth position. He states that these placards bore his signature and private address, and that he is certain that none others were exhibited at the show. The data set out on these placards, which were culled from official statistics, were subsequently reproduced in his journal.

In view of Mr. Laurie's charges, and their apparent reference to Mr. Grasby, it is due to the latter to state that they had not been previously printed in The Journal, and had they appeared in our columns, we know of no claim of priority that can possibly attach to the use of official statistics that are daily availed of by every writer in the public press. The signed articles in this Journal are contributed by experts in their own special lines, and whilst the editor reserves to himself the right of excising what might appear to be objectionable, or in his opinion erroneous, he can take no direct responsibility for them beyond what is legally incumbent upon those who edit a public print. In the present instance it should be stated that the September number was issued under pressure of work connected with the approaching Bureau Congress, and had not Mr. Laurie's paper been received at the eleventh hour the objectionable paragraph would certainly have been excised. It remains, therefore, for us to state that neither in fact nor in inference can any of the charges made in this paragraph be substantiated against Mr. Grasby or his journal.

POULTRY NOTES.

By D F. Laurie

Since my last notes the Royal Agricultural Show has been the chief item of importance in the poultry world. There was a splendid collection of birds, many being equal to any to be seen in the adjoining States. This is not to be wondered at when we consider that a number of breeders find prizewinning made more certain by sending to the eastern States for various noted birds, for which they pay heavy prices. As a result, we have an improvement yearly, but, of course, it depends on the individual breeders whether the stock of the State is benefited by these purchases There is a peculiarity among our breeders of calling birds purchased in the other States "imported." The breeders in Victoria, New South Wales, &c., never use the term unless referring to birds bred in England, America, or other oversea countries, New Zealand excepted.

As regards the judging at the Royal very little need be said, as both judges made awards with which one could not agree. The question of judging, however, is a difficult one.

The great interest evinced by visitors from the country pleased me more than anything, and one heard conversations which boded better for the industry than much of the vapid talk sometimes indulged in by fanciers.

It is said that next year an endeavour will be made to make the show more interesting to the producer, and a section will be devoted to groups of birds of the different breeds, after the manner of the excellent exhibit of Mr. T. A. Caterer, who for the few years he has been in the fancy has done a great deal to improve matters. It certainly would be a great help to those unacquainted with a breed if they could see a representative pen, consisting of a male and, say, seven or eight females.

I think, on the whole, visitors were able to gain a good deal of information about the exhibits, but there can be no question that the shed now allotted to poultry is quite unsuited to the purpose and very detrimental to the health of the exhibits; in fact, I believe the heat was responsible for the death ot some of the birds. Then, again, there was not space enough.

I had many interesting chats with old friends and readers of The Journal, and was delighted to find the extensive manner in which some farmers breed and rear poultry. Not only that, but I was informed in several cases of the profits made. In many cases these profits were large, because no extra food had been given to the birds; they found their own living. No account was taken of the benefits due to the destruction of insect pests which devastate the crops.

THE POULTRY LECTURE.

Although the attendance at my lecture on poultry at the School of Mines was not as good as could have been wished, still it showed that a strong interest is taken in the poultry question. It must also be remembered that many are down purely on a holiday, and one could hardly expect to make much headway against the enticements of the various sights and places of amusement. The kindly feeling evident, and the marked attention accorded made up for a lot of disappointments met in connection with the city and suburban fanciers

The whole view of the poultry question has so broadened that several lectures are required to give even an outline of the important aspects of the subject. Many matters that are familiar to the ordinary breeder are quite new to others, and one cannot lecture before a body of general breeders without stating many well-known facts, still new to many.

My allusion to co-operation and organization drew forth strong expressions of assent, and in those methods much remains to be performed. It is a question which might well be the theme of a general discussion at the Bureau branches. That such a scheme is necessary may be gathered from the poor prices reached by some of our produce, and also from the remarkable prices quoted by interested persons as to what they will condescend to give. The Canadians fought this matter out, with the result that their produce brings high prices. They found that isolated, irregular shipments were always at the mercy of the sharks of the trade, because the regular dealers could not depend on a stated quantity and quality. When the quality was carefully graded and regularity fairly assured, it was found that the better class of buyer would operate. This is one reason in favour of some action in the direction of co-operation.

NOTES.

Early hatched pullets will lay during autumn and winter. The late hatched birds seldom lay until spring, and are really very expensive to rear unless for table purposes, and even then they are slow growers.

Keep a close watch on vermin. Many chickens die from their ravages.

I have been informed that there is a lot of mortality among incubator chickens due to pneumonia. This is the natural result of using high-temperature brooders on the advice of those of little experience.

DEPARTMENT OF AGRICULTURE.

REMOVAL OF OFFICES.

The Offices of the Department of Agriculture are now situated in the Western Wing of the Jubilee Exhibition Building, North Terrace, Adelaide.

Members of the Agricultural Bureau are invited when in town to call at the Office. The Library of Agricultural Literature possessed by the Department can be consulted by anyone desirous of doing so during ordinary office hours.

DEPARTMENTAL NOTES AND WORK.

The annual Congress of the Agricultural Bureau was held during September Show week, the attendance, on the whole, being above the average. We regret, however, that more farmers unconnected with the Bureau do not attend these meetings. Apparently there is an impression abroad that the meetings are confined to members of the Bureau. Some complaints were made that the agenda paper was not posted to the delegates before they left home, and in this respect we certainly made a step backwards. The blame, however, does not rest with the Department, as a number of the branches neglected to send on subjects for discussion until nearly the end of August, and the agenda paper could not be finally arranged until about 10 days before the meetings commenced.

The annual "Farmers' Day" in connection with the Agricultural College on September 14 passed off very successfully. The imposition of a small charge to keep away those not practically interested in farming operations did not have the effect of lessening the number of visitors; in fact, the attendance this year was probably a record one, fully 400 visitors being present The crops and stock were generally favourably criticised.

Ever since 1894—that is 10 years ago—the annual Congress of the Bureau has been held in September Show week. Usually three evenings—viz., Wednesday, Thursday, and Friday– had been devoted to the Bureau meeting. In 1900, to meet the convenience of members, who might have other engagements during their visit to the city, the evenings were changed to Tuesday, Wednesday, and Thursday. About the same time—that is, about three years ago—the Farmers' Union started holding their meetings on the Thursday evening, much to the inconvenience of members of the Bureau who were also members of the Union. Reference to this clashing of the meetings was made at last Congress, and some appear to think that one of our meetings might be transferred to Friday. With this view we are unable to agree. The strain of work on officers of the Department during Congress is very considerable, and, in view of the arrangements that have to be made in connection with the annual visit to Roseworthy towards the end of the week, to substitute Friday night for Thursday night would not only complicate matters, but prove very harassing to those on whom the success of Congress mainly depends. It is evident, too, that the Bureau has by far the earlier claim on the Thursday The only admissible arrangement is that the Farmers' Union alter the date of their meeting to Friday evening.

The total number of students now enrolled at the College is 52 Twenty-five of the second and third year students rendered assistance to the judges of sheep at the Adelaide Show by holding the animals for examination, and were thereby enabled to pick up many useful hints from the criticisms and remarks of the judges.

The College exhibited an aged Berkshire boar and two Berkshire sows at the Adelaide Show The boar took second prize in his class, the younger sow took first prize for sow of any breed under one year old, and the other sow took the first prize as Berkshire sow, any age, and the champion prize for sow of any breed. One week before the sows were sent to Adelaide the younger one weighed 400 lb., and the other one, 16 months old, weighed 440 These sows were the progeny of the boar exhibited, and as a number of the College breeding sows are his stock, it was decided to sell him. He was bought by the Sewage Farm. The demand for young Berkshire breeding stock has been exceptionally brisk the past month, and everything is now sold out, with a few orders booked in advance.

On September 16 the Inspector of Fertilisers visited Kanmantoo for the purpose of inspecting a number of plots of grass land manured with fertilisers supplied by the Department. Several members of the branch were also present, and the plots were carefully examined. In every case there was considerably more feed on the manured plots, the clovers especially being conspicuous by their vigour; whereas on the unmanured strips generally a close search was required to reveal their presence. The members were not, however, prepared to say whether the extra growth would in the end pay for the outlay.

Inspectors Brown and Rowell have been busily employed on the examination of fruit and plants. During September 4,961 cases of fruit were imported, and 303 cases destroyed. The importations consisted mainly of bananas. The cases which were destroyed were treated with carbolic acid. and buried below the tide water level. Fifty-one packages of plants and trees were imported. A number of these have been detained, owing to absence of the necessary declaration. The export of vegetables to Broken Hill totalled 2,025 packages. During the same period 4,483 cases of fruit were inspected for interstate export. These consisted mainly of oranges, apples, bananas, and lemons. Seventy-seven packages of plants have been exported

COUNCIL OF AGRICULTURE.

The monthly meeting of the Council of Agriculture was held at the Department of Agriculture on Wednesday, September 30, all the members but Messrs. R. Marshall, J. Miller, and T. Hardy being present

The Hon. Minister intimated that he could not at present entertain the proposal to make certain courses of study at Roseworthy College available to women.

The secretary of the Public Library Board intimated that a number of agricultural publications were already available for loan to members of country institutes, under the usual regulations. Members generally appeared to think the list far from satisfactory for the purpose in view. On the motion of Mr. Molineux, it was decided that when the list to be prepared by the officers of the Department of the most suitable literature on agricultural subjects was ready, a copy be forwarded to the Public Library Board. with a suggestion that the country institutes be asked to secure some of the books recommended.

It was resolved, on the motion of Mr. Dawkins, that the Government be asked to have coloured illustrations of injurious and poisonous weeds prepared.

It was decided that meetings of the Council be held on the second Wednesday in each month.

The formation of the following branches was approved:—Utera Plains—Members, Messrs. A. R. and A. R. S. Ramsey, R., J., and J. Deer, sen., W. Hale, R J. West, A. Venning, E. Barrett, J. Guider, H. West, and Jame Deer; Queenscliffe—Members, Messrs. J. Turner, J. Melville, V. H. F. Cook, Ayliffe, E. Bates, P. T. and C. Bell, A. T. Whittle, K. Nash, J. Olds, J. Davis, J. Wright, J. Carter, R. Chapman, and A. Neave.

The following gentlemen were approved as members of the undermentioned branches:—Mannum, Mr. F. Richardson; Longwood, Messrs. H. Vogel and L. H. Hemer; Brinkworth, Messrs. J. Heinjus and T. Brinkworth; Forster, Mr. A. Schenscher; Meadows, Mr. S. F. Robinson; Woolundunga, Messrs. A. and W. Barrett and F. E. Becker; Gladstone, Mr. W. Bond; Holder, Mr. J. Phillips; Hartley, Mr. A. A. Stein; Scales Bay, Mr. R. Plush, jun.; Arthurton, Mr. T Lamshed; Morchard, Messrs. W. Reichstein and R. Barrie; Johnsburg, Mr. C. H. Dicker; Denial Bay, Messrs. J. Meier, H. Wiesselman, A. Hoffrichter, and Dr. S. Bruehl.

Mr. Caldwell read letter from Mr. J. A. Ruddick, of the Canadian Department of Agriculture, dealing with the maturing of cheese in cool storage. The system had proved very successful so far, and this year's experiments are expected to give even better results. It is found that if the temperature of the curing room exceeded 60 F. the quality of the cheese is affected. A great advantage is gained by dipping the cheese in refined paraffin wax, at a temperature of about 200 F. This leaves a thin coat of wax on the cheese, which prevents shrinkage and the development of mould. The dipped cheeses must be stored at a temperature of not more than 70 F.

Mr. Yelland moved that attention be again directed to the importance of developing the poultry industry, and to the necessity for attaching a poultry expert to the Department of Agriculture. The motion was carried unanimously.

Some discussion on inspection of dairies took place.

MONTHLY RAINFALL.

The following table shows the rainfall for the month of September, 1903:—

Adelaide	2·85
Hawker	3·25
Cradock	2·66
Wilson	3·12
Gordon	1·88
Quorn	2·88
Port Augusta	2·72
Port Germein	1·99
Port Pirie	2·11
Crystal Brook	2·58
Port Broughton	1·32
Bute	1·72
Hammond	1·93
Bruce	1·64
Wilmington	3·43
Melrose	3·02
Booleroo Centre	2·73
Wirrabara	2·63
Appila	2·49
Laura	3·18
Caltowie	2·36
Jamestown	2·83
Gladstone	3·33
Georgetown	3·02
Narridy	3·42
Redhill	2·71
Koolunga	2·37
Carrieton	1·66
Eurelia	1·30
Johnsburg	1·76
Orroroo	1·91
Black Rock	1·52
Petersburg	2·57
Yongala	2·35
Terowie	3·02
Yarcowie	2·81
Hallett	3·97
Mt. Bryan	4·87
Burra	3·96
Snowtown	2·11
Brinkworth	1·98
Blyth	2·29
Clare	3·90
Mintaro Central	3·49
Watervale	4·50
Auburn	3·94
Manoora	2·96
Hoyleton	2·87
Balaklava	1·70
Port Wakefield	1·09
Saddleworth	2·78
Marrabel	3·20
Riverton	2·75
Tarlee	2·52
Stockport	1·91
Hamley Bridge	1·48
Kapunda	2·59
Freeling	1·91
Stockwell	3·01
Nuriootpa	3·27
Angaston	2·82
Tanunda	3·25
Lyndoch	3·10
Mallala	1·52
Roseworthy	1·77
Gawler	2·03
Smithfield	1·97
Two Wells	1·40
Virginia	1·87
Salisbury	2·13
Tea Tree Gully	3·02
Magill	4·46
Mitcham	4·08
Crafers	7·71
Clarendon	5·11
Morphett Vale	3·64
Noarlunga	3·35
Willunga	4·60
Aldinga	3·61
Normanville	3·37
Yankalilla	3·43
Eudunda	2·87
Truro	2·46
Palmer	2·76
Mount Pleasant	4·37
Blumberg	4·38
Gumeracha	4·46
Lobethal	5·60
Woodside	6·01
Hahndorf	6·37
Nairne	5·81
Mount Barker	6·55
Echunga	6·19
Macclesfield	6·13
Meadows	6·00
Strathalbyn	2·69
Callington	3·46
Langhorne's Bridge	2·22
Milang	2·35
Wallaroo	0·91
Kadina	1·42
Moonta	1·08
Green's Plains	1·37
Maitland	1·91
Ardrossan	1·06
Port Victoria	1·15
Curramulka	1·97
Minlaton	1·62
Stansbury	1·48
Warooka	1·99
Yorketown	2·06
Edithburg	1·72
Fowler's Bay	0·67
Streaky Bay	1·74
Port Elliston	1·12
Port Lincoln	1·40
Cowell ...	0·72
Queenscliffe	1·56
Port Elliot	2·37
Goolwa	2·21
Meningie	2·02
Kingston	2·63
Robe	1·93
Beachport	1·91
Coonalpyn	2·36
Bordertown	3·24
Frances	2·55
Naracoorte	3·16
Lucindale	2·43
Penola	2·82
Millicent	2·12
Mount Gambier	2·50
Wellington	2·89
Murray Bridge	2·50
Mannum	1·99
Morgan	2·77
Overland Corner	2·53
Renmark	3·20

FARM AND DAIRY PRODUCE MARKETS REVIEW.

Messrs. A. W. Sandford & Co. report on October 1, 1903:—

More favourable climatic conditions could hardly be desired from a farmer's point of view than prevailed throughout the past month, the rainfall being the best for many years, for not only was it widespread, but fell at most opportune intervals, interspersed with excellent growing weather, and as it is now close up to harvesting time, farmers are eagerly looking forward to having a good yield. The far north has also participated in the splendid rains. Squatters report creeks running bankers and an unusually heavy supply of feed in nearly all districts.

Business throughout September has been much more active. No doubt the prospects of an excellent harvest, coupled with improved values in the wool market, have induced traders to operate more freely. Last month we reported break-up of the long drought at Broken Hill; since then the downpour has been of such a heavy character, authorities reckon that in the reservoirs and dams there are supplies for nearly 12 months. In metals, silver has steadily advanced, and has now touched a higher figure than for years; while lead has just about maintained, but copper is a shade weaker.

Although the European wheat is, as a rule, gathered in anything but good condition, buyers on the London market do not appear to be at all anxious to speculate in Australian cargoes at 31/ for 480 lb., c.i.f., United Kingdom, for orders December-January shipment is the highest offer obtainable which means that over 3/3 per bushel f.o.b., Port Adelaide, cannot be paid for the new season's wheat, even provided that the very low rate of freight now ruling is not advanced. Little or no business has been done in wheat or flour during the month, and values are difficult to quote. There is, however, a great anxiety on the part of millers and holders of flour to clear out everything before the new wheat comes in. The importers of wheat in Victoria and New South Wales have combined to keep up prices, and are talking of re-exporting the surplus, but they find it very difficult to make sales, and it is now certain that there has been considerable over-importation. Fodder Lines.—With growing feed plentiful, there is very little doing in chaff, and as similar conditions rule in the eastern states, no export to report, excepting a few odd lots forwarded on consignment to Sydney. In feeding grains, as expected, with prices drooping, there has been an absence of any think like parcels changing hands, so that business has only been of a retail character.

Potatoes.—Steady business has been put through, but the sales have been mostly for South Australian requirements, very few finding their way to the other States, and although values remain unaltered, holders are now becoming anxious to quit stocks, knowing that the next few weeks will bring along supplies of new local grown. Onions locally have had a quiet month, most of the sales effected being for export orders.

The favourable weather conditions for the marketing of dairy produce, coupled with the rapid increase in quantities, have no doubt given a further stimulus to the dairying industry. In fresh butter supplies have so increased that this State is now doing fair business with Western Australia, especially in factory lines; whilst several small shipments of dairy butter have been made to the old country also a couple of clearing lines that have been held over of old stocks of Victorian As expected, with the heavier yield, values during the month for fresh in prints eased until export rates were touched, but it is reckoned now that present prices will about sustain. Eggs.—Although the flush of the season is now on, quantities coming forward are not nearly equal to that of former years. Having this in view, bakers and picklers are operating at much higher rates than usually prevail at this time of the year with prices showing a slight hardening. Cheese, considering the lateness of the season, has met with good sale, buyers finding it difficult to secure quality, but already new make is beginning to come in. Bacon and hams have had brisk trade, orders from the West keeping the market well cleared. Factory sides show an advance of about 1d. per lb.

Honey.—Several shipping orders have kept this line moving, but no alteration in price to record.

Almonds.—Heavy purchases from the east have cleared the market of surplus stocks.

Carcass Meat.—Good rates for quality have ruled, prime pork especially commanding attention, also well-fed veal, but with the approach of warmer weather it is rather risky to forward in this form.

Live Poultry.—Extreme values have been secured; but the number of birds forwarded are not nearly equal to requirements.

MARKET QUOTATIONS OF THE DAY.

Wheat.—At Port Adelaide, shipping parcels, no demand; farmers' lots, 5/ on trucks, per bushel 60 ℔.

Flour.—City brands, £12 to £13; country, none offering.

Bran.—9d. to 10d.; pollard, 11d. to 1/ per bushel of 20 ℔.

Oats.—Local Algerian and Dun, 1/10 to 2/; white champions, 2/ to 2/4 per bushel 40 ℔.

Barley.—Malting, 4/ to 4/4; Cape, 2/ to 3/ per bushel 50 ℔.

Chaff.—£3 10/ to £3 15/ per ton of 2,240 ℔., bags in, f.o.b. Port Adelaide.

Potatoes.—Gambiers, £2 10/ per 2,240 ℔.

Onions.—Gambiers, £2 to £2 15/ per 2,240 ℔.

Butter.—Creamery and factory prints, 8¾d. to 10d.; private separator and best dairy, 7¾d. to 8¾d.; well graded store, 6d. to 7d.

Cheese.—S.A. best factory, 7d. to 8d.; new make, 6d. to 7d.

Bacon.—Factory cured sides, 9d. to 9½d.; farm flitches, 6¼d. to 7d. per ℔.

Hams.—S.A. factory, 10d. to 10½d. per ℔.

Eggs.—Loose, 8¾d.; in casks, f.o.b. 10¼d. per dozen.

Lard.—In bladders, 6d. to 6½d.; tins, 5d. to 6d. per ℔.

Honey.—3d. for best extracted, in 60-℔. tins; beeswax, 1/2 per ℔.

Almonds.—Fine soft shells, 5½d.; kernels, 11d. per ℔.

Carcass Meat.—Prime shop pork, 6d. to 6½d.; medium sorts to good baconers, 5d. to 5½d. Prime veal, 2½d. to 3½d.; light stuff, from 1d. to 2d.

Live Poultry.—Heavy weight table roosters, 2/3 to 2/9 each; hens and fair cockerels, 1/8 to 2/1; ducks, 2/6 to 3/6; geese, 3/9 to 4/9; pigeons, 9½d.; turkeys, 8d. to 10d. per ℔ live weight, for fair to good table birds.

Above quotations, unless when otherwise specified are duty paid values of imported lines. Grain, flour, and forage for export are f.o.b. prices at Port Adelaide. Dairy products are City Auction Mart rates. In grain, chaff, and potatoes sacks are included, but weighed as produce. Packages free with bulk butter and cheese.

AGRICULTURAL BUREAU CONGRESS.

The fifteenth annual Congress of the Agricultural Bureau of South Australia was held in the Federal Hall, Adelaide, on September 8, 9, 10, and 11. The Chairman of the Council of Agriculture (Mr. R. Caldwell) presided, and the following members of the Agricultural Bureau attended one or more sessions:—Amyton, Messrs. W. Hughes and S. Thomas; Angaston, Mr. F. Salter; Appila-Yarrowie, Messrs. H. Klemm, W. C. Francis, C. G. F. Bauer, and P. Lawson; Arden Vale, Messrs. J. Willis and M. Eckert; Arthurton, Messrs. J. B. Rowe, W. H. Hawke, and J. Welch; Balaklava, Messrs. G. Reid, W. H. Thompson, and W. Smith; Baroota Whim, Mr. C. W. Hoskin; Booleroo Centre, Messrs. N. Clack, F. McMartin, and J. Arthur; Bowhill, Mr. E. P. Weyland; Brinkworth, Mr. T. Hill; Burra, Messrs. F. G. Dawson, J. A. Arnold, A. McDonald, and W. Heinrich; Bute, Messrs. F. Masters and W. H. Sharman; Caltowie, Mr. J. N. McCallum; Carrieton, Mr. M. Manning; Clare, Messrs. J. Christison and W. Kelly· Colton, Mr. P. P. Kenny; Cradock, Mr. R. Solly: Crystal Brook, Messrs. P. Pavy, J. C. Symons, and A. Miell; Davenport, Messrs. F. H. Pybus and T. Hewitson; Dowlingville, Mr. J. Phelps; Elbow Hill, Mr. J. Rehn; Eudunda, Messrs. J. von Bertouch and W. H. Marshall; Forster, Mr. John Johns: Gawler River, Messrs. H. Roediger and A. Bray; Gladstone, Messrs. J. A. Gallasch and J. H. Rundle; Gumeracha, Messrs. W. Jamieson and A. Moore; Hahndorf, Mr. G. Sandow; Hartley, Messrs. B. Wundersitz and F Hassam; Hawker, Messrs. J. Smith and A. C. Hirsch; Holder, Messrs. J. E. Rowe and E. Jaeschke; Inkerman, Messrs. F. C. Smart, W. Board, J. Lomman, J. Sampson, C. H. Daniels, and C. E. Daniels; Johnsburg, Messrs. L. Chalmers and T. Potter; Kadina, Messrs. D. F. Kennedy, J. Malcolm, S. Small, and J. W. Taylor; Kanmantoo, Messrs. J. Downing and E. Downing; Kapunda, Messrs. W. M. Shannon and W. Flavel; Kingston, Messrs. W. Redman and W. Pinches; Koolunga, Messrs. T. B. Butcher and E. J. Shipway; Lipson, Mr. J. P. Barraud; Lucindale, Mr. B. A. Feuerheerdt; Lyndoch, Mr. B. F. Reu; Maitland, Messrs. J. Hill, H. G. Tossell, and H. H. Lamshed; Mallala, Messrs J. B. Stevenson, J. J. McCabe, and A. F. Wilson; Mannum, Messrs. J. G. Preiss and F. E. Schuetze; Meadows, Messrs. W. J. Stone, W. Pearson, and T. A. Buttery; Meningie, Messrs. C. Tiller and A. J. Myren; Millicent, Messrs. J. Davidson, A. McRostie, and R. Campbell; Minlaton, Mr. H. Boundy; Morchard, Messrs. E. J. Kitto, J. O'Loughlin, and H G. Kupke; Morgan, Messrs. E. Hausler and H. Wohling; Morphett Vale, Mr. A. C. Pocock; Mount Bryan East, Messrs. W. H. Quinn and A. F. Pohlner; Mount Gambier, Messrs. W. Mitchell, J. C. Ruwoldt and T. Edwards: Mount Pleasant, Mr. F. Thomson; Mount Remarkable, Messrs. T. H. Casley, S. Challenger, and J. H. Foote; Mundoora, Mr. R. Harris; Murray Bridge, Messrs. B. Jaensch and W. Schubert; Nantawarra, Messrs. S. Sleep, J. Nicholls, R. Nicholls, A. L. Greenshields, T. Dixon, E. J. Herbert, and A. F. Herbert; Narracoorte, Messrs. S. Schinckel, and J. G. Forster; Narridy, Messrs. W. Freebairn and J. N. Dixon; Onetree Hill, Messrs. F. L. Ifould, J. Clucas, and F. Bowman; Orroroo, Messrs. J. Moody, W. S. Lillicrapp, W. T. Brown, and W. Robertson; Paskeville, Messrs. W. S. O'Grady and J. P. Pontifex; Penola, Messrs. H. Richardson and L. W. Peake; Petersburg, Messrs. H. Earle, J. Wilson, and F. W. Sambell; Pine Forest, Messrs. R. Barr, jun., and F. Bayne; Port Broughton, Messrs. E. Dennis and W. Tonkin; Port Elliot, Messrs. O. B. Hutchinson, W. E. Hargreaves, and J. McLeod; Port Germein, Messrs. T. Smith and J. R. Gluyas; Port Lincoln, Messrs. J. D. Bruce, J. O'Shanahan, and T. Laidlaw; Port Pirie, Messrs. T. Bell, T. Johns, G. M. Wright, and E. J. Hector; Pyap, Messrs. G. H. Mills and C. Billett; Quorn, Messrs. R. Thompson and G. Walker; Redhill, Messrs. D. Lithgow and F. Wheaton; Reeves Plains, Messrs. W. H. Day and J. G. Folland; Rhine Villa, Mr F. E. Hecker; Richman's Creek, Messrs. J. M. Kelly and W Freebairn; Riverton, Messrs. H. T. Gray, T. Gravestocks, and A. J. Davis; Saddleworth, Messrs. G. Benger, J. H. Frost, F. Coleman and W. H. Bee; Stansbury, Mr. H. C. Pitt; Stockport, Messrs. J. F. Godfree and D. Stribling; Strathalbyn, Messrs. M. Rankine and J. Cheriton; Swan Reach, Messrs. J. L. Baker and F. Brecht; Tatiara, Messrs W. E. Fisher, T. Stanton, and E. Prescott; Wandearah, Messrs. G. Robertson and J. Dick; Watervale, Messrs. S. Solly, H. Scovell, and E. W. Castine; Wepowie, Messrs. H. Gray and E. C. Smith; Whyte Yarcowie, Messrs. D. Dowd, T. Pascoe, and J. E. Hunt; Willunga, Messrs. W. J. Binney, J. A. Hughes, and H. Richards;

Wilmington, Mr. A. Maslin; Wilson, Messrs. J. Coombe and W. H. Neal; Woodside, Messrs. W. Rollbusch, A. S. Hughes, and R. P. Keddie; Woolundunga, Messrs. N. Rogers, J. Greig, and J. Walker; Yankalilla, Messrs. J. Cornish and D. Stone; Yorketown, Messrs. W. Correll, J. Davey, and C. Domaschenz.

The Council for Agriculture was represented by Messrs. R. Caldwell, A. Molineux, Col. J. Rowell, C.B., J. W. Sandford, T. E. Yelland, J. Miller, R. Marshall, and F. Krichauff. The Department of Agriculture by Professor A. J. Perkins, Secretary for Agriculture; Professor J. D. Towar, Principal Roseworthy Agricultural College; and Messrs. C. J. Valentine, Chief Inspector of Stock; G. Quinn, Inspector of Fruit; G. S. Thomson, Dairy Instructor; and W. L. Summers, Inspector of Fertilisers.

Tuesday Evening, September 8.

Opening Address.

The Hon. R. Butler (Minister of Agriculture), in opening the Congress, said —Mr. Chairman, ladies, and gentlemen, it gives me much gratification to be again in the position to say a few words to you. I believe this is the fifteenth Congress you have held since the Agricultural Bureau system was started, and of these I have had the privilege of opening five. Of course, I appreciate very highly the position I hold, and hope the longer I occupy a public position the more I shall retain your confidence and that of the people of the State. When I opened the conference about this time last year the best parts of the country were not in nearly so prosperous a state as they are to-day. The result of the harvest however, was something different to what was expected and what had ever been seen before in South Australia. The farmers over a large area not only had very good crops but very good prices, and a fair-sized area south of the Burra gave, I suppose, better crops as regards value than it had ever produced before. Last year practically no return was received from 700,000 acres, but I do not think that anything like the same calamity will be experienced this year. (Hear, hear.) Doubtless in some parts there has not been a superabundance of rain, but the last fortnight's rainfall has greatly improved the position, and, barring any scourge like rust, you may safely expect one of the best harvests South Australia has had for many years. You are not going to get the same prices this year, and you would not have got last year's prices if the drought had not extended over the whole continent. I think you will get a fair price for your wheat, but if you cut much hay I do not know what you are going to do with it, as I believe the other States will cut enough for their own requirements. It has occurred to me as a farmer that the business of farming is getting much more interesting than it was in years gone by. We are beginning to realize by carrying out experiments ourselves and comparing notes that we can do very much in our dry climate by a thorough system of cultivation, which is gradually increasing the return from the land. This year 1,200,000 acres were put in crop with fertilisers in South Australia, the quantity of manures used being 45,000 tons. Had it not been for the phosphates the return would not have been half what it was last year. (Hear, hear.) One result of the use of the drill and fertilisers was the bringing within the range of profitable cultivation a large area of country where the rainfall was sufficient, but where the poverty of the soil did not make cultivation remunerative. In the south-east and along the Murray I do not mean right up the Murray—there is poor mallee country, but this land during the past two or three years has returned really good crops. I met a gentleman from Yorke's Peninsula the other day, and he told me that mallee country which a few years ago was considered hardly fit for cultivation is now by the use of fertilisers giving good returns. A few years ago Mr. Copley in the House of Assembly suggested that the Government should offer a reward for the discovery of phosphates in South Australia. A bonus of £500 was offered, and there is no doubt that this has resulted in the discovery of what I believe will be three profitable phosphate deposits. Mr. Brown, the Government Geologist, than whom there is no more cautious or reliable man in the Civil Service, has reported favourably on the discoveries at Clinton, on Yorke's Peninsula, at Robertstown, and also near Kapunda. If any of these discoveries should result in the opening up of a big phosphate mine, we can supply ourselves with the article for the manufacture of superphosphates here, and the result would be the giving of employment to many men in this country. We would probably be able also to supply the continent of Australia with crude phosphates in the future in place of shipments being procured from Christmas Island. A year or two ago a resolution was carried in the House of Assembly, on the motion of Mr. Rounsevell, to the effect that the Department of Agriculture should undertake experiments in connection with manures and varieties of rust-resistant wheats, and they have proved most valuable to the State. The results of the experiments carried out last year have appeared in The Journal of Agriculture, and doubtless you have seen them. You will have noticed that the records are very favourable indeed, and go to show us what can be done with various classes of manures and different varieties of wheats in different dry districts in this State. At Murray Bridge rust-resistant wheat sown on a remarkably sandy top soil with a clay subsoil averaged from 13 to 16 bushels per acre, although the rainfall was only 7¾ inches. The figures showed that despite the light rainfall good results had been obtained by the use of superphosphates, and by a proper system of cultivation. A somewhat similar result has been reported from Purnong, on the east of the Murray, where a rainfall of 5 inches was registered. At Lipson, with a rainfall of 8½ inches, and an application of Thomas phosphate, up to 12 bushels per acre were reaped, and where superphosphates were used up to 22 and 27 bushel yields were obtained. These figures show what might be expected from the country under a proper system of cultivation if there is a fairly good rainfall. My experience this last year was that I got 17 bushels per acre off fallowed land, but only 3 bushels from a clayey paddock alongside which had not been under fallow. Both fields got the same amount of manure, but the difference in the yields clearly showed the benefit of proper cultivation. I would like to say that while the Government is credited with doing many wrong things, such as increasing taxation, you farmers have been experiencing very much better times during the past few years I think you realize this, however, that no Government would be worthy of the support of the people of South Australia unless it was determined at all hazards to keep up the credit of the State by paying its way. When farmers come to me for £500 or £1,000 for roads in their districts my reply is that if your corporations and you can afford to pay extra taxation for the roads it is all right, but under the present circumstances I have no money to give unless I take it from you in the first place. You must therefore recognise that while you are perfectly justified in making your requests, the money must be found before it can be handed over. There is one thing I wish particularly to speak to you about, and that is the by-products. I have been a very warm advocate of the development of the by-products of the State. Last year we exported eggs to the value of £108,000, and, although the season was a dry one, the exports of frozen meat were the highest on record in South Australia. I think you will all agree with me that it is a great mistake to suppose by encouraging the export of produce we are ultimately putting up prices in the State. My experience in the past had been that when the people depended on local consumption, as soon as they had supplied the local demand prices fell to such an extent that three-quarters of the producers dropped out of the industry altogether. Consequently prices fluctuated greatly. Although shipments of frozen meat, principally lambs, had been exported from the State during the past five or six years, and many sheep had died on account of the drought, the number of sheep in South Australia to-day showed an increase of over half a million for the period during which exportations have been made. This conclusively proved that now we have found a market for our frozen meat half a dozen people keep sheep where one man kept them four or five years ago. If we only got decent seasons in the outside country now, in spite of a large export of lambs and mutton the numbers would increase rather than decrease. As far as prices are concerned, last year they were exceptionally good. I fully realize how difficult it is to carry on the Government Export Depot, because of the jealousies created. After the expenditure of a large amount of taxpayers' money the producers themselves did not support the institution as they should: they do not appear to realize they are partners in the concern. The reason of this is that where the people get good cash prices they take them without bothering any further about the

London market, but they might just as well get all the possible profits. One gentleman at Mount Templeton sends small shipments of lambs to London every year. Last year he sent some weighing 42 and 43 lb. through the Depot, and netted on the whole 12/ a piece—a very paying price indeed. Not only was the system of manuring the land of great benefit from a cereal point of view, but it was certain to prove of much value to the fodder crops. After a paddock had been manured for a few years it would be found that double the quantity of feed would be obtained from it. Paddocks at the Roseworthy Agricultural College that had been manured for some years with phosphates would carry more stock than other farms in that district. In connection with our fruit industry, last year we exported to London the largest quantity of apples ever sent from South Australia; it was something over 30,000 cases, and we had no reason to fear comparison with fruit sent from any other part of the world to London Our apples, as regards flavour and quality, are recognised in London as superior to imports from other countries I think the department shipped about 5,000 cases for our producers, and these netted 7/4 per case. Of course the difficulty was in selecting the sound fruit, rendered necessary on account of the presence of the codlin moth in orchards, but if we can control the moth there is every prospect of a large and payable industry in this direction.

Colonel Rowell—You should try and get the freights lower.

Mr. Butler—I believe the freights are coming down this year; but how can the Government interfere in such a matter? It was a peculiar thing that almost from the time we had interstate free trade up had gone the freights to the other States Mr. Gilbert had told him that the freight for chaff to Sydney was much higher than it was three or four years ago. I suppose the advantages of interstate free trade is going into the pockets of the shipowners of the various lines, who have raised the freight. Last year we could afford to pay the higher freights on account of the high prices, but our only chance of competing in the eastern markets in chaff and wheat, now that the drought has ended, lies in low freights In connection with the wine trade, the quantity made during the last two years was 5,000,000 gallons, or 2,000,000 gallons more than produced in any previous two years We have reason to look forward to a great development of this industry, especially as the markets of the other States are open to us. At the Roseworthy Agricultural College we now have between 50 and 60 students, and we have this year increased the teaching staff. Mr. Quinn, the horticultural instructor, than whom no officer in South Australia is more deserving of the support of the producers, has spent a lot of time at the College lately Besides carrying out improvements in the orchard, he has, with the assistance of the students, got the vegetable garden into first class order. Mr Thomson, the dairy expert, goes to the College every week to lecture, and, besides these two additions to the staff, Mr Faulkner has taken the place of farm manager. Mr. Faulkner comes from Yorke's Peninsula, where his father is a farmer. He received his education at the College, and took the highest degrees there. I think you will be struck with the great improvement in the crops when you visit the farm next week, but, of course, we have had exceptionally good rains there. I visited the College last Monday, and was greatly pleased with what I saw. In looking through your agenda paper I am glad to notice that the Congress will discuss questions relating to the growing of fodder crops, poultry farming, and horse and pig breeding. In connection with fodder plants, it means that if you grow more crops a larger number of stock will be carried on the land, and nothing in my opinion would be more beneficial to the State. If proper attention is paid to poultry farming and pig breeding it will be time and money well spent It affords me much pleasure in declaring the Congress open. (Cheers)

Mr J. Cornish (Yankalilla) moved a vote of thanks to the Hon. Minister for his address. Now that we were likely to experience better seasons he advised producers to export frozen meat through the Produce Depot. Even the small farmers, with 100 sheep or lambs to dispose of from year to year, should ship them through the depot, and reap all the profits that were obtainable.

Mr. W. Kelly (Clare) seconded the motion which was carried with acclamation.

Chairman's Address.

Mr. Caldwell said that this was the second time he addressed the Congress as Chairman, and in all probability it would be the last, because a motion was being brought forward to prevent any member of the Council of Agriculture from occupying the position of Chairman for more than two consecutive years. He was pleased to preside over the Congress again, and was glad to meet them under such favourable conditions as then prevailed. Last year in the mid-north the high prices obtained by the farmers for their wheat and hay came as an agreeable surprise to them, but settlers further north had not been so fortunate. Many who had struggled in vain against adversity had to seek for the relief that went so much against the grain of honest and independent agriculturists. He was pleased with the admission of the Treasurer that all the success in growing crops was not due to the use of manures. In Mr. Caldwell's opinion the larger half of the success was due to the larger areas of fallow ground and the better handling of the land generally. He had noticed this particularly during a visit to the north a few days previously. A forward movement in agriculture was going on throughout the State. The members of the Council of Agriculture, he believed, represented the greatest interests of the State, and the membership of the Council included level-headed men, who could well be entrusted with the important matters relating to agriculture, horticulture, viticulture, and other similar industries. The Council desired to come in closer touch with the Agricultural Bureau, and every facility for this should be given. It was only by coming into touch with one another that the interests of the producers could be materially advanced. In the average districts in South Australia we had an excellent soil, and he did not believe any of the other States of the Commonwealth had a similar area of good country. All that was wanted was a more generous rainfall. In a journey from Adelaide to Wilmington he had passed over 200 miles of magnificent wheatgrowing land, and was much impressed with the orchards to be seen on the way. They showed that the possibilities of the country were indeed great. The possibilities of agriculture had not been reached; the possibilities of horticulture had barely been touched; and as far as viticulture was concerned there was plenty of room for the development of that industry. In agricultural countries the dairying industry was recognised as one of the most permanent, and much more attention might be paid to it in South Australia. His advice to many farmers was to keep cows instead of exporting their hay. In Mr. Thomson, the Government dairy expert, South Australia possessed a most capable officer. The Treasurer had told them that they needed to be economical, and he could assure them the Council of Agriculture had been extremely careful. But it was possible to carry economy so far as to prevent them from doing justice to themselves or to the people with whom they should come in contact. He hoped their Congress would be pleasant and profitable. (Cheers.)

Wednesday Morning, September 9.

GROWING FODDER CROPS.

The Chairman called on Mr. F. L. Ifould, of Onetree Hill Branch, who read the following paper on this subject:—

The growing of fodder crops is not as general as it should be; even a small patch of barley is not known on many farms. Certainly there are a few farmers who realize the value of a small plot of green stuff, and the time is fast approaching when the growing of some kind of fodder for early feed, especially for milk cows, will be practised to a very much greater extent. A ton of green feed ready to cut in June or July is of greater value than many tons later in the season, when feed generally is plentiful; and dairy people especially should not lose sight of this fact. They would be enabled to have a few cows come in earlier, and thus secure the high prices then generally ruling for produce. They would also be extending the milking season of their cows, especially when the practice of growing summer fodder is adopted. But the latter is not so easy in many localities, as the success of the crop depends mainly on our uncertain summer rains. But wherever it is possible to extend our supply of green food farmers and graziers should avail themselves of the opportunity, as undoubtedly the shortness of our grass season throughout the State generally is a serious drawback, not only to the dairying industry, but to grazing throughout all its branches. When we have to depend entirely on our natural grasses there is far too much lost time in our dairy herd, and a period when all kinds of stock suffer for the want of some succulent food. And if we could manage to grow something that will come in a few weeks earlier in the season and likewise at the end it would make all the difference to our profit and loss account.

On most farms a small piece of ground handy to the homestead can generally be found suitable for the purpose. The advantages of fallowing for growing any kind of fodder crops should be borne in mind; I would advise to fallow early, and apply in a heavy dressing all the farmyard manure available, and where this is not sufficient commercial fertilisers can be used with advantage, but must be applied liberally in order to force the crop on early, or some of the advantages of the practice would be lost. There are various kinds of cereals which will be found suitable for most localities, and the earlier the varieties the better. Cape barley, rye, and several early kinds of wheat, especially Bartlett's Crossbred, will be found most suitable. When only a few stock are required to be fed the crop can be mown with a scythe and given them but when the feeding is intended on a larger scale this will involve too much labour, and several small paddocks should be used for the purpose; the stock can be turned in for a short time each day, and when one paddock is eaten down sufficiently remove the stock to another; the crops will be found (if the ground is moist and heavily manured) to soon grow up, when it can be treated in the same way again. Care must be taken not to turn stock in when the ground is wet and boggy. In addition to the cereals used for early fodder crops, rape and mustard are beginning to find favour with the farmers, and the general opinion from those who have tried these fodders is that they are very suitable. And I know of no more valuable fodder for milk cows or sheep than rape; it is very milk producing and fattening, and when cows are fed on it the increase of milk is astonishing, consequently a valuable food for ewes and lambs. Pigs also are very partial to it and thrive well when they can can get plenty of it. Mustard being the earlier of the two should also be sown, and is a good fodder, but not so milk producing. It imparts a bad taste to the milk. Rape also imparts a taint in a less degree, but where the milk is put through a separator it mostly disappears. The mutton from sheep fed exclusively on these fodders has a most disagreeable smell when cooking and a slight taste.

I have never experienced any difficulty in getting my cows to eat rape, but like most new fodders it is an acquired taste; they do not eat much at first, which perhaps is as well, but they soon get very fond of it, and I have never known any serious results from turning stock on it. I usually turn the cows in for a short time each day to prevent waste. Essex rape will be found the most suitable for fodder, and I have grown both broad leaf mustard and the ordinary variety; and find that stock greatly prefer the latter. Two and a half or 3 lb. of rape and mustard seed per acre is sufficient, and should be drilled in fairly deep. Sow after the first rains, and it will get a good start before the weather gets too wet and cold. The stock can be turned in when the crop is ready, and if not fed too bare it soon grows up again. I fed a paddock of rape off last year many times from July right up to the end of November, and when I ploughed the paddock then after a rain the crop was shooting. The mustard did not last so long, but seemed to die out gradually after it had been eaten once or twice. When the rape begins to run to seed (usually about the end of September or the beginning of October) it should be kept fed down fairly hard. I consider from the paddock of rape, containing five acres, I had as much feed as from any 50 acres of grass land on the place. If farmers in many districts would try to grow this very valuable fodder the results would surprise them, and small paddocks set apart for the purpose would well repay the trouble, for in addition to feeding milk cows, early lambs (which command a high price) can be raised, and the carrying capacity of the farm increased.

In addition to growing early feed for our stock a good deal remains to be done in the shape of summer crops. Of course, where lucerne can be successfully grown we have no need to look for a substitute, but unfortunately this grandest of all fodders can only be grown in a few favoured localities Maize and the sorghum family can be grown in the hilly districts with a fair degree of success. And the dairyman especially must look to something to take the place of the grass, which unfortunately goes off only too soon; the milk supply becomes very short, and various troubles begin among his herd in the shape of impaction, &c., which most dairymen in this State realize to their cost. Unless the cattle can get something succulent in the shape of summer fodder or ensilage losses will invariably occur, and a fair yield of milk is out of the question. Any rich, moist land that has been fallowed early and deep and well worked down should be sown with maize, sorghum, &c., the latter end of August or beginning of September, when the crop will get a good start before all the rains have gone. After that they must take their chance of any summer rains that may fall, but if they get a good start it is surprising what little rain is necessary to ensure fair results. I find these crops are benefited little, if any, by the application of commercial fertilisers. I prefer maize for milking cows, as it comes up earlier and more evenly, and stands a better chance of being benefited by any late rains that may fall. It is also sweeter and more succulent than the sorghum family, and is more appreciated by the cattle. It will not stand a long spell of dry weather like the sorghum, but the latter does not seem to germinate so well as maize. The hotter the weather the faster the crops grow, so long as there is any moisture in the soil. About 1½ bushels of maize, and from 5 to 7 lb. of sorghum, holcus, or amber cane seed drilled in fairly deep will be found to be a fair quantity. A good crop of wheat can be grown on the land after these summer crops, although perhaps not quite so good as on the bare fallow

Should the crop of maize, &c., be abundant, and cannot all be eaten before it gets too matured, it will make splendid ensilage, especially if chaffed. I have noticed several reports of poisoning having occurred through turning stock into these crops, but fortunately I have not experienced any difficulty in the matter. When the maize is in flower, and the sorghum, &c., is coming into seed, the stock should be turned in for a short time each day, but where only a little is grown it is safer and more economical to cut it and feed to them. These crops are more suitable for cattle and horses than sheep, as the latter will only eat the leaves and leave the stalks standing bare, which is not only a waste, but will prove troublesome when putting in the land to wheat. Maize when cut or fed off will not shoot out again, but the sorghum will yield a good second growth, especially if a summer rain should occur. Maize matures earlier than the latter, and if it is sown at the same time it will give a succession of crop. Horse-tooth maize is the best variety for fodder purposes, and I think amber cane and planter's friend best of the sorghums. I feel certain that in the near future the growing of fodder crops will occupy the attention of farmers and dairymen especially more than it has in the past. Of course, I am aware that in many parts of our agricultural districts, especially on the plains and in the north, these fodders cannot be grown with any degree of certainty; but in the hilly districts, where the rainfall is fairly reliable, a very great deal remains to be done in this direction

Mr. F. E. H. W. Krichauff considered that the growing of fodder crops was far too much neglected. The lesson they had been taught in the dry seasons would do some good if they paid greater attention to these crops in the future The only fault he had to find with the paper was that no mention was made of mangolds. They grew to perfection in many places in the State, and he had successfully grown them and many other fodder plants on his farm on the Bugle Ranges. One he had found very successful was red clover (Trifolium incarnatum), and he hoped they would try it. Farmers in the moister districts could sow the seed with barley, and cut the barley before the clover was sufficiently high to be injured. As a fodder it was exceedingly good, and cattle ate it with relish. As regards mangolds, he had seen them growing in the Mount Gambier and Millicent districts to an enormous size—larger than they were to be seen even in Europe.

Mr. F. G. Dawson (Burra) thought the paper contained valuable suggestions. Although there was only a comparatively small rainfall in the Burra district last year, it was no exaggeration to say that an average of 40 tons of mangolds per acre was obtained from land that had been thoroughly cultivated and manured. He got 30 tons per acre from his own land, but the decrease compared with the other yields was due to his using manure in the "green" state.

Mr. D. Lithgow (Redhill) said, in reference to the growing of rape, a farmer in his district turned three milch cows into a paddock of this feed at 3 o'clock one afternoon. They became blown, and one died shortly afterwards.

Mr. W. E. Fisher (Tatiara) said although the rainfall was small in the part of the State from which he came, he grew mangolds there weighing about 30 lb. When he started operations he was advised that he would be unsuccessful, but had proved otherwise. He had been told that the roots were more nutritious after they had been pulled a few days, and had proved such was the case.

Mr. W. Jamieson (Gumeracha) stated that he had experimented with the growing of fodder crops, but had not been very successful. He found changing feed too much was not good for the cows, and during June and July they required a little more grain to keep up their milk supply. He had grown many acres of maize, but last year decided he was not going to grow any more. When he turned the stock into the paddocks the fodder was destroyed. His cows would not give a quantity of milk from mangolds, and it was too much labour weeding them, especially during winter.

Mr. J. Davidson (Millicent) declared that it had been demonstrated that it was profitable for dairy farmers to grow fodders of different kinds. His New Zealand experience showed him that rape was an excellent feed for lambs, and for topping up sheep for market. In regard to the growing of fodder crops in South Australia locality must first be taken into consideration Farmers should endeavour to carry out experiments in a small way, as they were likely to reap considerable benefit therefrom.

Mr. T. Smith (Port Germein) said he tried rape on a sandy soil last year, and considering the small rainfall that was recorded the return was a splendid one. Lucerne did fairly well, but owing to a flood in the summer silt was carried over it, causing it to die off. The rape stood up better than any crop. The mustard he experimented with ran to seed too quickly, and he did not grow amber cane because it took too much nourishment from the land.

Mr. J. Downing (Kanmantoo) considered the Cape oat the best early crop. It did not remain on the ground as did the Cape barley, but got away much quicker.

Mr. W. Tiller (Meningie) said that skinless barley was very sweet, and grew faster than the Cape barley

A delegate thought that every farmer should grow a few acres of lucerne and mustard When the lucerne stopped growing then the mustard came along; when the mustard went off the lucerne made headway again in spring.

Mr. D. F. Kennedy (Kadina) stated that during his travels all over South Australia last year he made enquiries regarding fodder crops. He was told in the south-east that farmers there got 60 and 70 tons of mangolds per acre. One farmer stated that mangolds were deeprooting plants, and the land was improved through their roots penetrating to such a depth. In another locality in the south-east he was informed they grew rape to exterminate weeds, such as the native poppy, and after that could make use of the feed.

Mr. J. Miller thought it most encouraging to see a young man like Mr. Ifould deal with so important a matter in so capable a manner. There were hundreds of acres of lucerne now growing on the Broughton, although it was once said it would not grow there. He thought other large areas would yet be found where lucerne could be grown.

Mr. S. Challenger (Mount Remarkable) said if low prices of wheat were coming they would have to look to the cow to pay the grocer unless they wished to close the year with a liability. Some delegates recommended the growing of early feed for the winter, but his experience was that green feed was wanted for the summer. (A Voice—"We want it for both winter and summer.") If lucerne and mangolds would grow in a district they should be sown. Years ago he had seen mangolds growing successfully in one of the driest districts in the north.

Mr. T. Bell (Port Pirie) said he thought South Australian farmers had a lot yet to learn in regard to fodder crops. A bad time had been experienced for several years in the Port Pirie district, and he had tried to grow sorghum for three years in succession, but had to give up the task in despair. In regard to impaction, he found that green fodder kept away the disease for a long while, but his cows had lately been attacked with it. There was something about impaction that was not yet known.

Mr. R. Barr, jun. (Pine Forest), said his experience had been like that of the previous speaker. In his district he found that it did not pay to grow lucerne or sorghum, because of the number of bad seasons they got. During the past four years he had put wheat in early in the season, namely, in February. This year he had 50 acres under crop, and the wheat came away earlier than usual. The cattle were turned into it, and it was out in ear in March. He could recommend this practice, as on account of having adopted it he had been able to get splendid feed for his working horses and cattle. If it did not produce a crop after the stock were taken out of the paddock it would pay as early feed.

Mr. Ifould, in reply, said his paper dealt with his own practical experience. The neglect to mention mangolds in the paper he admitted was a serious omission. He had proved them very profitable, but they must bear in mind that this crop involved a lot of labour. If mangolds grew so well in the Burra, as stated, he did not think they could do better than pay considerable attention to that crop. He had turned cows, sheep, and horses into the rape paddocks, and they had not been blown. With regard to the remarks of Mr. Jamieson, they must remember that the Gumeracha district was a very wet one, and in such places it did not do to turn stock on the crops in winter. In his district he found that amber cane did not do injury to the soil. His experience was that Cape oats were not so much relished by cattle as barley, especially the skinless variety. If rye were allowed to get too old it got hard, and cattle would not eat it. His advice was, do not let it get too old. (Hear, hear.) If in dry localities they did not get summer rains they could not expect to grow summer fodder crops. He did not agree with the speaker who said it was no use troubling about feed in the early winter months. In his district they had found the rape and other early crops most acceptable.

REARING HORSE STOCK ON SMALL FARMS.

Mr. B. Jaensch read the following paper, prepared by Mr. W. Schubert, of Murray Bridge Branch:—

Every farmer should breed and rear on the farm the horse stock required for his own use. This, however, I believe, is not done on many farms, and where undertaken has not always proved as successful as it should have. Reasons for this were not difficult to find. Owing to the fact that our pastures are not so good as they used to be, it is not now possible in most cases to rear the young stock entirely on grass after they are weaned, as was the case in the early days. Small farms of late years have been overstocked, and little or no preparations have been made in good seasons for supplies of fodder to carry the stock through bad years. In many instances unsuitable mares have been utilized for breeding; how often when the mare is not much use for work has her owner used her for breeding purposes? Then another factor in the failure to make horsebreeding a success has been the use of inferior stallions; because they were the cheapest they have been patronised, hence the many undersized and almost useless horses we meet with nowadays.

To succeed in rearing profitable horse stock we must pick out our best mares or buy one or two for that matter, if we do not already possess suitable animals. Then endeavour to induce the owner of a stallion of the right stamp to mate with your mares to travel the district. See to it that you have your mares in good condition in August or September, so that you get them in foal early, as it will add pounds to the value of the foal, and also give you the opportunity of getting the mares in foal early the following season.

When your mares are near foaling time, be sure to separate them from the other stock, and have them in an enclosure near the homestead, so that they can be seen at all times. To prevent mishaps always inspect them last thing at night. It is a wise practice to put the mares and foals in a paddock with good feed in order to prevent the mares falling away in condition and the foals getting a check. When the pastures begin to go off it will be necessary to give them other food to make up for the loss. Handle the foals as early as possible. At six months old they may be weaned. Shut them up in a loose box and feed on bran, oats, and chaff, and you will find that in a few weeks they forget their desire for their mothers' milk. Do not feed the mare too well at weaning time, otherwise the milk will not dry off quickly. In three weeks' time the foals may be allowed to run with the mares again, as they will not trouble them much.

After weaning the foal be sure you keep it in good condition; therein lies the secret of making a good horse of him. The foal should be fed through the winter much the same as the working horses, so that it will have a chance to continue to grow and develop evenly. By the time it is 2½ years old it will, if treated as described, be sufficiently grown to take its place in the team. and do its share of work with the other horses without suffering in any way from being broken in while young. Not only will the horse be fit to work much earlier if well looked after while young, but if you desire to sell him you will readily get a good price for him.

Mr. P. Johns (Port Pirie) agreed with the writer of the paper. The mares should be in good condition, but not fat; and if there was a reasonable amount of care in trying to meet the requirements of the stallion good results should be obtained.

Mr. D. Lithgow (Redhill) said he had not got so much satisfaction as might be expected from the travelling stallions, and had been more successful in breeding when he kept one of his own, although his horse was perhaps not one of the best.

Mr. D. F. Kennedy (Kadina) said he had had an unfortunate experience in horse breeding during the past nine years. For three consecutive years out of the nine he tried blood stallions, but the mares did not get in foal. At last four of the mares got in foal, but unfortunately it was last year, and three out of the four died.

Mr. J. Davey (Yorketown) said when he used to rear horses he got not more than 50 per cent. of foals from the travelling stallions. The reason the percentage was not higher was because the stallions served too many mares. It would only be honest on the part of the owner of a stallion to restrict the number of animals served, and if they did this they would certainly get a better percentage.

Mr. S. Challenger (Mount Remarkable) thought there was a good deal in what the previous speakers had said, but the low percentage of foals was not always the fault of the owner of the stallion. Some farmers took a mare from a plough to have her served, and put her back in the plough again immediately afterwards. That was not fair. The mares should be put into a paddock to be served. Then too, they were often put to the stallion before the proper time.

Mr. E. J. Shipway (Koolunga) did not believe in a tax on stallions, as he thought every man had a right to do what he liked with his own property. Some breeders attempted to do too much, by overstocking the farms. With regard to the payment of service fees, he did not think the farmer should be called upon to pay a certain proportion of the charge until his mare had been served for the last time.

Mr. J. N. McCallum (Caltowie) thought that if foals were weaned at six months old it would be necessary to attend to them well afterwards He considered from his experience that that period was a little too early. The breaking-in of colts at 2½ years old was also too early. He worked them lightly at three years, and put them to work in summer when they were 3½ years of age

Mr. J. L. Ifould (Onetree Hill) thought that the advice that farmers should breed their own horses was quite right, but the money for service was no small item to many of them. They could work mares during the season but just at the proper time they must be given a spell of a week or two. He did not think the breaking-in of colts at 2½ years too early. He worked them lightly right through seeding time, feeding them well during that period, and they picked up in condition. It was far better to educate them at 2½ years than when they got older.

Mr. W. W. Pinches (Kingston) said he had had experience in the breeding of draught horses and ponies, and he got good percentages. The best method was to turn the mares loose with the stallion. This was a great advantage in breeding ponies. A good deal to do with a horse not coming up to expectations was because he was worked too heavily when young. The same remark applied to young rams.

Mr. F. G. Dawson (Burra) did not agree with the writer of the paper that a young horse was sufficiently well grown to do its equal share of work if broken in at 2½ years old

Mr. W. Jamieson (Gumeracha) thought it more difficult to get foals than to rear them. One cause of that, which had not been mentioned, was agricultural shows. He had noticed that a number of horses that had been got up for show purposes did not give good percentages, and that was not to be wondered at when they considered that the animals had nine inches of fat round their ribs.

Mr. J. Cheriton (Strathalbyn) disagreed with the statement that it was necessary that all farmers should breed horses. It was a great mistake for all to take up one thing as if they did so they would find it would not pay. If he saw all his neighbours taking up a certain line of work, he would turn his attention to something in another direction.

Mr. H. Gray (Wepowie) said he usually kept a horse of his own, and nearly always got the mares in foal. Every farmer should rear enough horses on the farm for his own use

Mr. J. Greig (Woolundunga) stated that he had gone to considerable expense in purchasing a stallion for the district, and consequently expected remunerative service fees Some men, who spoke about restricting the number of mares put to a stallion, objected to even paying a service fee of £2 2/ for a good horse. Some farmers went so far as to say that if their mares did not get in foal they should not be expected to pay service fees at all, but such a proposal was most unfair to the owner of a stallion.

Mr. W E. Fischer (Tatiara) considered that if farmers wanted good horses they must feed the foals well after they were weaned. In regard to the breaking-in of horses at 2½ years old, he believed in teaching them early.

Mr. T. Bell (Port Pirie) agreed with the remarks of the paper concerning the working of young horses. It would be beneficial to the owner and the horse to work it a few hours each day.

Mr. F C Smart (Inkerman) believed that farmers made a great mistake in working mares too much when they were in foal He had had to lift a foal on to its feet for several days after it had been dropped, and he attributed this to the mare being worked more than she should have been. A subsequent foal got by a stallion inferior to that first used, had turned out remarkably, and proved more profitable than the two-year-old one. The mare had only a little work during the time she was carrying the second foal, and he believed that that had something to do with it. Mares should be kept from other horses a short while before they foaled.

Mr. J. Lomman (Inkerman) was of the opinion that the weaning of foals took longer than three weeks. If they put the stallion with the mare 10 days after the latter had foaled, she was almost certain to become pregnant again—that was if she were healthy. He had known instances where foals were not got because the mares were put with the stallions before or after the proper time.

Mr. B. Jaensch (Murray Bridge) said he had found that mares three or four years old, when put to the stallion, bred well. A great mistake was made in allowing mares to grow too old before putting them to the stallion He reared from four to seven foals every year, but never stable fed them after weaning. His foals were left to shift for themselves, and he thought they became hardier by the adoption of such a practice, but of course he kept very good paddocks of feed for them.

Mr. A. J. Myren (Meningie) said the horses he had broken in at two years old were as good as those broken in at four or five years. Horses he had broken in at two years and worked gently he had sold at £30 each. In connection with procuring foals the trouble lay in the stallion serving too many mares in a day. Stallions were also knocked up through travelling too far. The serving of 30 or 40 mares a year was quite sufficient for any stallion, and if they went beyond that he did not think the entire would do justice to the mares.

Wednesday Afternoon, September 9.

POULTRY FARMING

Mr. J. von Bertouch, of Eudunda branch, read the following paper on this subject:—

I have for many years observed, in making out farmers' taxation returns, that in average seasons the farmer, after providing for seed wheat, rent of land, or interest on mortgage of land, labour, food for working stock, repairs to machinery and harness, and other necessary outlay, had nothing or very little over for his own labour, and has lived on the produce from cows and poultry. Knowing from personal observation that generally poultry are not kept on the farm as they should be, I came to the conclusion that with proper attention poultry farming would pay well, and from the following particulars it will be observed that a practical test has borne out my conclusion:—

About September, 1901, I started as a novice with about 25 to 30 fowls, principally Leghorns and Minorcas, bought an incubator, made brooders, foster mothers, and portable iron houses, after my own ideas, and by the end of December had about 500 chickens, on less than half an acre of land. In January, 1902, I moved out to a suitable house with 18 acres bare land, on which I made subdivision fences, erected shelter sheds, divided the birds into colonies of about 50 in each, sold out cockerels, and had about 300 pullets left, of which through inexperience in the treatment of cases of roup, cholera, and other troubles I lost about 50. Then I bought and studied poultry books, especially deriving very valuable information from L. Wright's illustrated book of poultry, by the aid of which I overcame many difficulties. It is important to remark that I am away from home half of every week, and can only do the work before and after office hours, and for minor work keep only a lad as assistant.

After my first pullets started laying, I commenced keeping accounts of income and expenditure. From August 1, 1902, to August 1, 1903, the result has been:—

	£	s.	d.	£	s.	d.
Sales of eggs				£90	1	8
Sales of birds				15	18	3
Value of eggs and birds used at home (low estimate)				8	5	0
Value of increase of birds in stock				9	7	6
				£123	12	5
Expenditure.						
Cost of food (wheat, average price at 5/ per bush.)	£60	16	6			
Cost of settings of eggs from pure breeds	3	14	0			
Cost of labour	6	10	0			
	£71	0	6			
Leaving a profit for the year				£52	11	11
Gross return per bird averaged	£0	9	11			
Average cost per bird (including labour)	0	5	8			
Net profit per bird (on 250 birds)	£0	4	3			

For the first year you will admit that the result has been satisfactory in spite of high prices ruling for food and the heavy losses sustained through diseases, which at first proved a task to battle against, but with perseverance and experiments I managed to overcome the troubles of diseases. Now I am pleased to say that all my birds are healthy, and as I have culled out all inferior birds I may safely anticipate a much better result for the second year. If wheat costs 5/ per bushel, eggs cost 8¼d. per dozen to produce, taking the average throughout the year. I realized 11¾d. per dozen on the average for eggs sold at the stores and Adelaide market. When the price was below 8d. per dozen I pickled eggs in a clear solution, consisting of 2 lb. lime and 1 lb. salt to every 2 gall. of boiling water. Excepting in the pure breed pens no rooster is allowed with the hens, because the hens are tamer and lay better if kept by themselves. Infertile eggs are best for market, as they keep better, and realize better prices when they can be guaranteed as fresh and infertile. I obtained up to 1/8 per dozen wholesale for pickled eggs. Eggs must be collected at least once every day; and while pickling put the eggs in pickle regularly each day after washing them if soiled.

I have six colonies of birds in a field of 3½ acres, divided into as nearly equal yards as possible. In the middle of the field a large roosting shed, 33 ft. x 16 ft. is built, and each yard is connected with it, the shed being divided into six also. In each yard is a shelter shed with sloping sides and back, constructed of mallee stakes and brush, with straw roof, and closed on three sides. Each yard abuts on to a patch of green stuff 8 ft. to 40 ft. in width, according to space available. Clumps of trees to provide shade have been planted in each yard, and in addition rows of tree lucerne or carob are being grown as breakwinds.

Regularity in times of feeding is important. I give a warm mash in the morning, made as follows, with occasional variations:—Chaffed or cut green feed, such as kale, mustard, lucerne, sorghum, mangolds, and turnips, is boiled with some potatoes, crushed barley, and oats, and a little copra cake; lastly, just before feeding, add bran, pollard, and bonemeal, so that the mash is not sloppy nor sticky. Put the food on boards or flat dishes, and not on dirty ground. At night time feed only wheat or other hard grain; scatter the grain well between cocky chaff or straw, to keep birds busy and promote health. Two and a half ounces of food, exclusive of green food, is the average daily ration given each grown-up bird. Chickens must be fed more often, but only a little at a time. All penned up birds in breeding pens get a plentiful supply of chaffed kale, barley, lucerne, or grass at midday. Shell grit, cracked quartz, glass, or phosphate rock grit, and charcoal are always supplied. Two or three times a week the breeding pens receive cut green bone, which is put through a Stearne's green bonecutter. Drinking water must be kept clean, and shaded in hot weather. Douglas mixture helps to ward off diseases and improves the plumage of birds; add a tablespoonful to each quart of drinking water. To make the mixture, dissolve 8 oz. sulphate of iron in a gallon of boiling water; when dissolved add 1 oz. sulphuric acid, keep the mixture in an earthenware or glass vessel until cool, then bottle it and keep for use as above. Draughty roosting houses cause colds and roup in fowls. Close three sides and roof; have the open side of house away from the prevailing westerly winds. For the prevention of vermin portable iron houses are best, and in the long run the cheapest, besides being easily constructed. Provide dust baths. Use the whitewash brush freely. I mix whitewash as follows:—To 7 lb. fresh lime put 3 tablespoonfuls of flour of sulphur, 3 tablespoonfuls of crude carbolic acid, mix, then add 4 gallons boiling water, apply warm. This will destroy all vermin.

To cure roup in early stages, and even very severe cases, I have found the following mixture efficacious:—To an eggcupful of glycerine, add about a teaspoonful of kerosine, 3 drops of pure carbolic acid, and 5 or 6 drops eucalyptus oil; apply with a feather to nostrils and mouth. If cheesy matter be present, remove that first, and wash affected parts freely with dilute Condy's fluid. Isolate affected birds. In bad cases take the bird, use axe, spade, and ground. For cholera a good remedy is ground charcoal, mixed with well-boiled rice (or dry ground rice), add some pepper and cinnamon, and feed a little at a time. Supply very little water with a few drops of Douglas mixture in it. A reliable cure for gapes is green garlic, cut fine, and given before the birds go to roost. Never use in the breeding pens any bird that has at any time been very ill.

In my opinion egg production is the best payable branch on a poultry farm: therefore, I have with care selected separate pens of the best laying kinds of birds, viz:—White Leghorns, Brown Leghorns, Minorcas, Gold and Silver Wyandottes, and Black Orpingtons. I also keep a cross utility pen, wherein a good Golden Wyandotte cock bird is mated with Dorking, Indian Game, Orpington, and Brown Leghorn hens, and find by treating all customers fairly that the sale of sittings of eggs from pure birds, at reasonable prices, is well worth the extra care needed to keep the several strains pure.

Mr. von Bertouch said he wished to add a few remarks. His birds were much superior to what they were the year before, and he considered value, which he had put at £15, a low estimate. He had to pay for everything, and farmers should be able to make a greater profit than he did, because there were many pickings on the farm. Greenstuff had been grown with little or no trouble by him. He had not included interest on the cost, depreciation of the plant, &c., because there had been a return of 50 per cent. in one year. Where a few fowls were kept on places where there were a good few scraps, doubtless the profit would be greater than his had been. Any farmer working on proper lines should be able to double the profit he had made.

The Chairman said he recollected reading in a paper that eggs in the United States were of a greater monetary value than all the minerals raised from the soil there. He would like Mr. von Bertouch to give congress some idea of the expenses to which he was put in providing the splendid yards, &c., for his fowls.

Mr. von Bertouch said the cost including wire netting, &c., was close upon £95. He had a plan of the houses, which also showed a portable brooder, besides a foster mother, which was better than the best hen, and in which he had raised 500 chickens in a short while.

Mr. J. R. Gluyas (Port Germein) declared that in his experience with poultry, sometimes he found them pay, while at other times they did not. Lately he had been feeding 300 fowls and getting no return from them. A neighbour had four or five colonies of birds, which he could shift about his farm, the yards being portable, and he believed that he had been very successful He believed that if poultry received proper attention and feed they would prove profitable.

Mr. W. M. Shannon (Kapunda) said he had visited Mr. von Bertouch's poultry establishment last Saturday, and what he had seen had been an eye-opener to him. From what had been done in America, he was sure a great deal could be accomplished in that business in South Australia. It would be a splendid thing for them to encourage the womenfolk on the farm to take considerable interest in poultry.

Mr. J. Lomman (Inkerman) said the paper contained some useful hints concerning poultry diseases. He did not believe in getting poultry from other yards, as disease was introduced into flocks that way. He would not take a well-bred fowl from any one who offered to give it to him, because of the fear of introducing tick among his birds. Although his place had never been infested with tick, he had heard sufficient about the pest to make him resolve to do all he could to keep it away from his yards.

Mr. G. W. Walker (Quorn) had had considerable experience in poultry, and thought it was necessary to pay attention to egg production in the "outside" country, as the residents there could not compete in table bird breeding at present.

Mr. W. Smith (Balaklava) stated that he had been keeping fowls for the last five years, and the only objection he had to them was that they liked to get at the hay stack. However, they were unable to get there, as he had erected wire netting around the stack. They were more profitable than almost anything else on the farm. If a farmer grew from 200 to 300 acres of wheat, he would have sufficient rubbish therefrom to keep 200 or 300 fowls for over six months. He fed his birds on wheat, and they were kept in a paddock of between three and four acres in extent. They also had plenty of green feed. For a few years his principal living had been from the fowls. Many who had advised him not to undertake poultry keeping were glad enough now to come to him for eggs. He had been foolish enough to buy fowls, instead of eggs for hatching, and as a result got the tick, which he still had on his premises. His profit had been a great deal larger than that of Mr. von Bertouch.

Mr. A. S. Hughes (Woodside) said he would be pleased if Mr. von Bertouch would tell them what success he had had with the incubator. One of the present difficulties appeared to be the keeping of the machine at a certain temperature, and another what the temperature should be. Most of the loss of chicks appeared to take place just at hatching time. Some people said that foster mothers bred disease and caused death. He would like to know if that were true.

Mr. S. Challenger (Mount Remarkable) thought that the best results were obtained by keeping young fowls and breeding throughout the year. Then they would have eggs the whole year. It was not advisable to keep fowls after they were three years old. If some of the wheat grown on the farm were kept there, and fed to poultry, &c., instead of being sold, they would get far better returns. He had got rid of tick by putting some damp cocky chaff in the fowlhouse, and setting fire to it. That created a dense smoke, which cleared out the tick. Since then he had given the fowlhouse an occasional smoking to kill any vermin which might happen to be there. It was a good plan to get an old wagon tire and place it in the poultry yard. Within the space it formed, when put flat on the ground, ashes from the fireplaces could be placed, and would be much appreciated by the fowls, which would be unable to scratch them beyond a certain limit.

Mr. E. J. Shipway (Koolunga) did not care to take up the keeping of fowls himself, but his wife took considerable interest in them. Only lately he had found how dangerous a little neglect was in the keeping of poultry. Some time ago his fowls kept dying, and he did not know the cause until he went to remove a machine from a shed, when he found clusters of ticks in enormous numbers. All those who were free from the pest should be very careful not to get them. Although tick was still found on his premises, he was keeping them fairly under control, and he never had healthier birds than he had that day.

Mr. F. G. Dawson (Burra) appreciated the success that had attended Mr. von Bertouch's efforts. He had done something himself in poultry-keeping under unfavourable conditions. He had kept fowls for 12 years, and although he had not given them all the attention he could have wished, they had brought him in some money. Although he was placed under the disadvantage of having wooden houses, his birds kept free from vermin, and that was largely due to their not being overcrowded.

Mr. T. Gravestocks (Riverton) believed that the keeping of 50 to 60 fowls would pay better in the course of 12 months than two cows, while the trouble involved in attending to the birds would be much less. Cleanliness in the poultry yards and houses, however, must on no account be overlooked. For a period of this year he had been longer without eggs than he had ever known before, but the cause of that he did not know. He had been without eggs for three or four weeks.

Mr. T. H. Casely (Mount Remarkable) considered that tick was the great curse to poultry breeding in South Australia. Where the fowls were allowed to roost about the stables they would find that in a very large number of cases the stables themselves became infested. When erecting the framework of a fowlhouse, the iron portions should be put on inside, and the place kept thoroughly whitewashed.

Mr. von Bertouch, in replying to the criticisms, said he had been paying attention to the laying qualities of the hens, and had very considerably increased the average from his fowls this year, compared with last year. When he went to his place, he found it infested with ticks, but he got rid of them. Green bone was excellent for poultry, and it would pay them to use it. The temperature at which the incubator should be kept was a most important point. The safest temperature to keep the eggs was 103 to 104 degrees, and it did not matter if it occasionally went one or two degrees above or below that, so long as they did not let it remain so for any length of time. For duck eggs he kept the temperature at 102 to 102½ degrees. The brooder had kept his chickens alive far better than a hen could. The hen lost chicks by stepping on them, and running too far with them. He advised them not to rear chickens too early. If they kept their birds clean and attended to them, they would get eggs all the year round. As regards the item of £6 10 for assistance, that only represented part of the wages paid to a boy, who attended to his horse, and did other work for him, besides looking after the fowls.

PIG BREEDING.

Mr. A. S. Hughes, of Woodside branch, read the following paper on this subject:—

Within the past few years the breeding and fattening of pigs has become an important industry in many parts of this State. A few years ago we scarcely ever heard of a bacon factory, now we have a number of large and well-appointed establishments devoted to the manufacture of bacon and similar products. In view of the probable development in this industry, the breeding of suitable kinds of pigs warrants greater attention on the part of our dairymen.

I find the crossbred sows better than purebred, as they have larger litters, make better mothers, are more vigorous, and will thrive on poorer food than the purebred sows. The cross I favour most is the Berkshire-Poland-China. Probably the best way to get suitable crossbred sows for breeding purposes is to buy a first-class Poland-China sow—get a good one even if she costs a pound or two more—and mate her to a good Berkshire boar. I would not advise buying this boar, but would hire him, as it is from his progeny that the sows for breeding will be selected. The sow should have a litter of at least eight or ten pigs, and when these are six weeks old you should be able to pick out three good young sows to keep. I would not advise taking more than the three best, as although some breeders may hold that if any of the litter are good enough, all should be, you will find that there is almost always some considerable difference in the quality of the pigs in the litter. It is a good plan to leave only the three selected pigs with the sow for another fortnight or three weeks to give them a good start, which means a great deal.

In selecting young sows care should be taken to pick only those having 12 to 14 teats; some only have eight, and these are of little use for breeding purposes, as you want to get larger litters if possible. Another thing I would recommend, and that is to select those showing most of the Poland-China type, as it must be remembered that the sows are to be mated again with a Berkshire boar. About a week after the first litter is weaned, put the sow to the boar again, and from the next litter select two or three more of the best to increase the number of breeding sows. This, of course, takes time, but I assume that I am speaking to farmers that do not want or cannot afford to spend a lot of money to start with.

The best way to get your boar is to buy a sucker from a well-known breeder. Choose one from a large litter if possible, as there is no doubt that this will make all the difference in the litters you get from the sows mated with him. Feed the boar well, but on no account let him get too fat, the same applies to the sows which can be mated at nine or ten months' old. Some breeders say on no account should the sows be put with the boar until they are 12 months old, but I find this a great mistake, as if not bred from until after they are that age they never make such good mothers as the younger sows, are not such good milkers nor so careful, nor do they bear such large litters I will say here that a big flow of milk is one of the most important points in your sows, as without it they cannot rear large litters satisfactorily, as no food you can give them will make up for a poor supply of milk from the sow With heavy milkers there is, of course, the possibility of losing one occasionally from milk fever, but it was better to risk this loss than to have a lot of sows with a poor flow of milk.

If at the first litter the sow kills two or three of them, give her another trial if she is a good pig; should the same thing occur again, however, fatten her for market as she is careless and cannot be trusted. We hear of all sorts of methods to keep sows from lying on their young, but they are not wanted as a careful mother is better than any of them. Give the sow a stye with a good floor, and a small quantity of short straw, and if she is careful she will never lie on her young. It is a good plan to have two or three sows to pig at the same time, so that if any die, or their litters are small, you can give all to one sow, and thus save food and trouble Even when the litters are large I find it a good plan to put two lots in one pen when they are three days old, as in the cold weather they help to keep each other warm.

The best food for the sow for the first fortnight after she pigs is bran: it is a great mistake to give her corn during this period, but afterwards she requires a liberal ration three times a day. The sow will take the boar again three days after she pigs, but I consider two litters a year best; this means mating her about 10 weeks after pigging. When the sows have had four litters, pick out a few young ones to keep for breeding, as I find that after the sixth litter, the sows are not so regular, and there will be several small pigs among the litters. It will also be necessary to secure another boar, as inbreeding will only lead to failure.

I find it a good plan to have several small paddocks, which should be sown with oats or barley. When the crop is about a foot in height turn in the sows; it is the cheapest and most healthy food that they can have after the young are weaned. A lucerne paddock is a splendid standby in the summer; with a good growth the sows will need very little else.

I can recommend strongly the system of depasturing sows on green feed; in fact, this is the only proper way to keep them in health. I do not pen them up until a week before they are going to farrow and then give them light feed.

Mr. S. Challenger (Mount Remarkable) asked if Mr. Hughes had kept the white Yorkshires?

Mr. Hughes said yes, but he preferred the Berkshire to the Yorkshire.

Mr. F. Coleman (Saddleworth) said Mr. Hughes recommended bran as the feed for the first fortnight, and wished to know if anything else was mixed with it.

Mr. Hughes—Bran with a little skim milk.

Mr. J. B. Stephenson (Mallala)—Have you tried barley?

Mr. Hughes—It is too heating at first.

In answer to other questions, Mr. Hughes said sows would not root up the pastures if they were not left too long on them so they became bare. They should want them to root up the feed a little for the sake of their health, and on no account should they ring the sows. When they rooted up the soil they were in search of something, such as charcoal. The Essex and Berkshire made a good cross.

Mr. J. McLeod (Port Elliot) said he had seen pigs sold at as low a price as 12/, but that was a long time ago. He thought a lot of the Poland-Chinas, as they made the best of mothers, were very prolific, and exceptionally hardy. He could not agree with the remarks of Mr. Hughes on the rooting propensities of pigs. During the last few weeks his pigs had been rooting up the ground in an extraordinary way. Perhaps they were in search of worms after the heavy rains. Pigs were very profitable to keep, and he knew of a sow that had given a return of £39 from two litters.

Mr. F. C. Smart (Inkerman) said that a few years ago, when farmers in his district were suffering from drought, the pig was about the only thing on the farm that paid. One year he had two or three sows running together and they farrowed at about the same time, there being between 20 and 30 young pigs. It was found that some of the youngsters did not do well, and did not appear to get a fair share of the feed. In later years he had taken the precaution to have the sows breeding at different periods and the result was far more satisfactory, the small pigs keeping in as good a condition as the larger ones. When there was extra food, such as milk, the sow with the litter always got it.

Mr. Hughes suggested that another Bureau member should on some occasion give a paper on fattening pigs for market. In reference to the profits on pigs he found it best to sell them when they were six weeks old. For the last two years they had never been under 10/. The sows averaged £4 10/ per litter, and as it did not cost much to keep a sow they could soon reckon up the profits. He knew of an instance where in three years £98 had been netted from one sow, the man fattening the young pigs himself. Pigs were one of the most profitable animals that could be kept on the farm. People in his neighbourhood were buying them at present for the purpose of fattening them for market, and as they were realizing a handsome profit the delegates could be assured there was money in pig farming.

Wednesday Evening, September 9.

Professor Towar, who was heartily welcomed, said that they must not expect any very definite statements from him just yet. He had not been here long enough to criticise too directly the farming practices; he had learnt a lot during the past 12 months about their climatic conditions, and many of their methods seemed to him open to question; still, until he had more experience in South Australia he would prefer to suggest thoughts for their consideration based on his American experience. Professor Towar then read the following paper:—

SOME SUGGESTIONS FOR SOUTH AUSTRALIAN FARMERS.

The second year of my residence in South Australia is now well advanced, and the weather conditions prevailing now, and which have prevailed since my arrival, are such as to inspire new hopes and promise brighter prospects than existed a twelvemonth ago. Were the probabilities in favour of the continued prosperity of to-day we could all make suggestions and improvements on present methods, which would certainly result in better returns from our land and labour than we are now enjoying. But the uncertainty of so many of Nature's ways, the liability of a return of the drought and its attendant disasters, check my ardour and enthusiasm to as yet advise anything beyond what is reasonably safe and practically sure to succeed. The situation is like an investment, a matter of speculation, and any diversion from the tried methods is accompanied with an element of risk, which turns one to the soliloquy of the Shaksperian hero, and we "rather bear those ills we have than fly to others we know not of." Owing to the variety of conditions which obtain in the different parts of the State, no definite policy can be universal, and, furthermore, a farm practice successful in one district may prove a total failure in another Whether in the northern, central, or southern localities, however, there seems to be ample room for diversifying the general system of farming. That is to keep more livestock on the hay and grain farms, grow other crops than wheat and oats, erect silos to store green feed, construct more dams and other means of conserving water, and more intelligently study better methods of agricultural theory and practice I suggest the keeping of more livestock, especially from the fact that they should return a handsome profit; that sheep products are concentrated materials, proportionately cheap to market (in fact they will walk to the sale yards), they take but little fertility from the land, and they get a good part of their living from the seeds and plants of weeds, which are becoming the curse of so many farms. What is true of sheep may also be said to a certain extent of other livestock, and may be even emphasized so far as poultry is concerned It may be argued, that in the face of threatened drought, short crops and scant feed, a large investment in livestock is liable to be followed by financial disaster, but if in the colder countries they can afford to store feed in dry form, or as silage every year in quantity sufficient to handfeed all the stock of the farm for a period of four to six months, and then sell all their products in a much cheaper market, it does seem reasonable. I am convinced that the greatest need of Australian agriculture, a permanent and reliable water supply, can be and will be eventually secured What the Government is doing on a large scale at Barossa, Bundaleer, and elsewhere can be done in a small way on many hundreds of private estates, similar to what was done at Collingrove and Pewsey Vale. Local systems worked by the co-operation of a few neighbouring farmers, especially in the vicinity of the hills, are certainly possible, and can be constructed with greater efficiency and less expense. What it is possible to accomplish with artesian bores, and what the Government is capable of doing, willing to do, and will do, are very hopeful factors in the solution of this most serious and important problem. The use of lime and cement in the construction of dams on porous land and inexpensive though effectual coverings to prevent evaporation, are matters of business, worthy of serious thought, study, and investigation by the Agricultural Bureau. The contour and texture of the land are such that water flows to the sea, but there seems to be abundant opportunity to construct storage basins where water sufficient for any emergency can with slight expense be held. I would be consuming valuable time if I were to expand upon the merits of keeping more livestock, and were I to advise a general rush to livestock husbandry, there could properly follow a just and severe criticism on such advice. Yet, you will probably agree that livestock was a means through which numerous benefits were derived, and which could not be obtained in any other way. The destruction of weeds, the utilization of the feed on which we could not realize in any other way are sufficient reasons for keeping some stock, while the fact that livestock removes but the minimum of fertility from the land, and the expense of marketing is proportionately less than for any other commodity should argue for a mixed husbandry with the maximum of domestic animals. Furthermore, it pays directly. But in connection with the livestock question, there is ample room for a study of the adaptability of breeds to the various requirements. Numerous experiments conducted at the American Experiment Stations and by breeders have demonstrated beyond a shadow of doubt that, to achieve the best success, the stock raiser must study specialized breeding. If he wants beef or mutton he must develop those breeds which have a natural propensity to convert the best part of their food into meat and fat. If dairying or wool growing is to be the object of his work, the stock raiser must confine his attention to the dairy breeds of cattle, and to the wool-producing sheep. It was contrary to Nature to expect both beef and milk in the highest degree from the same cow. My excuse for presenting the following results of experiments with cattle is that I have seen little mongrel Jersey bulls among Ayrshires, grown for beef, and I have heard a dairying community considering the purchase of a shorthorn bull.

CATTLE TESTS AT IOWA.

Recently at the Iowa Experimental Station in the U.S.A., nine breeds of cattle were tested in a feeding experiment lasting 92 days, the object being to determine—

(1) The grain required to produce a cwt. of gain.
(2) The percentage of dressed weights of carcases.
(3) The percentage of loose tallow in the beef.
(4) The experts' valuation on the dressed beef.

The breeds employed were Hereford, Shorthorn, Galloway, Polled Angus, Red Polled, Swiss, Devon, Holstein, and Jersey. In the amount of grain required to produce a cwt. of meat the Shorthorn proved the winner. The dairy and general purpose breeds, however, held their own with the recognised beef breeds in this respec In percentage of dressed weight, compared with weight of carcase, they ranked in the following order:—Red polled, 65.2 per cent.; Hereford, 65 per cent.; Polled Angus, 64.8 per cent.; Swiss, 64.8 per cent.; Shorthorn, 64.4 per cent.; Galloway, 63.9 per cent.; Devon, 63.6 per cent.; Holstein, 62.6 per cent.; Jersey, 60.5 per cent. In percentage of loose tallow they range in the following order:—Swiss, 11.7 per cent.; Hereford, 12.6 per cent.; Red Poll, 12.6 per cent.; Shorthorn, 13.3 per cent.; Galloway, 13.5 per cent.; Polled Angus, 13.8 per cent.; Devon, 15 per cent.; Holstein, 17.9 per cent.; Jersey, 18.8 per cent. Shorthorn steers, dressing 1,100 ℔., yielded 145 ℔. of loose tallow, or 13.3 per cent. of total weight. Jerseys, averaging 880 ℔., yielded over 165 ℔. of loose tallow, or 18.8 per cent. The beef breeds place a large proportion of the fat between the muscular fibres of the tissues. Steers of the dairy breeds deposit the fat about the intestines and kidneys. The former makes the meat tender and toothsome; the latter is of little value. The final test, that of relative value per ℔. live weight of the representatives of the various breeds is most important and conclusive. The figures below are the joint verdict of three experienced stock buyers, who passed judgment on the two animals of each breed as they were driven into the slaughter house.

Breed.	Average Live Weight.	Valuation per ℔.
Hereford	1,525	6⅝ or 3 5-16d.
Shorthorn	1,660	6⅜ or 3 3-16d
Galloway	1,635	6⅜ or 3 3-16d.
Polled Angus	1,725	6⅜ or 3 3-16d.
Red Polled	1,5[illegible]0	6¼ or 3⅛d.
Swiss	1,570	6 or 3d.
Devon	1,290	5¾ or 2⅞d.
Holstein	1,410	5 or 2½d.
Jersey	1,430	2½ or 2¼d.

The conclusion to be drawn from these figures is that beef breeds may not make more gain on given amount of feed, but they gave a marked higher percentage of dressed beef, and a much greater percentage of that beef was marketable at top prices owing to the abundance of loose fat in the dairy representatives, while the estimated difference in value live weight between the Hereford, a true beef type, and the Jersey, a typical dairy animal, was 32 per cent. of the value of the better animal. It would be an injustice to those most estimable and queenly of beasts, the dairy cows, and in particular the breeds which have for centuries been bred, fed, and selected for dairy performance, to pass this subject without reference to another important experiment recently completed, in which a similar test was made to determine which was the better breed for dairy purposes.

PAN-AMERICAN EXPERIMENT.

The experiment in question was conducted by the Live Stock Department of the Pan-American Exposition in 1901; it included 10 breeds of cattle, and continued for a period of six months. The test, while serving as a most attractive and educational feature of the exposition, had for its prime object to show which of the 10 breeds would make the greatest net profit upon each of the four following points —

(a) Production of butter fat.

(b) Production of churned butter.

(c) Production of total solids in milk.

(d) Production of total solids in milk and gain in live weight.

The following breeds were represented —Jersey, Guernsey, Polled Jersey, Ayrshire, Holstein-Friesian, Brown Swiss, French Canadian, Red Polled, Shorthorn, and Dutch Belted. Other beef breeds wisely kept out, or would have fared worse than the Jersey and Holsteins did in the beef test already referred to The Exposition Company provided stables well equipped for care, health, and management of the cows, and a special manager was appointed to look after them. An advisory board, representing the various breeds in the test, watched the tests throughout. The man employed for each herd was appointed on recommendation of the association representing that special breed. Animals selected for the test were five of each breed, from the best herds in the country The result of this experiment is summed up as follows —(a) First prize for net profit in butter fat, won by Guernesy, second by Jersey (b) First prize for net profit in churned butter, won by Guernsey, second by Jersey. (c) First prize for net profit in total solids, won by Holsteins, second by Ayrshires. (d) First prize for net profit in total live weight, won by Holsteins second Ayrshire. The order in profit from the money invested in feed from the butter fat test was as follows.—Guernsey, Jersey, French Canadian, Polled Jersey, Ayrshire, Red Poll, Holstein, Swiss, Shorthorn, and Dutch Belted The last named were actually fed at a loss, while Shorthorns made a profit of only 1 per cent.

I have hinted that a greater number of crops should be grown to ensure a supply of good feed throughout the year, and provide the variety of feed so essential to health and to the realization of the greatest profit from the various animals. This suggestion introduces the subject of feeds and rations which is in itself a topic of prime importance In order to realize the most from your animals and feed you must so combine the ration as to feed a balance of the dry and the green, or loosening feeds; of the coarse and the concentrates; of the various chemical constitutents and, with all, the savoury and digestible that will conform to Nature's demands in each individual animal. The farrow cow, the cow heavy in milk, and the fattening bullock, each demands food for a special purpose, and the experiences of the European and American scientists go to prove that a study of the physical properties and the chemical composition of foods, leads the way to more economical feeding methods for the various requirements of our domestic animals. I believe the farm horses of America do more work and keep in better condition than the Australian horses, and, if they do, I can account for it in no other way than that the former receive a ration better adapted to the requirements of working animals. Chemically the hay and chaff of wheat and oats lacked in the digestible food constituents which go to make muscle and produce energy, and as these crops got more mature before harvesting, the stalks and leaves turned to woody fibre, which was much less nutritious and digestible than the crop cut in the early stages of ripening. A ration adapted to the requirements of the animals was so balanced that the muscle producing and the fat and heat producing constituents bear a definite relation to each other.

With clover, lucerne, peas, bran, and linseed, the one sided wheat and oaten hay could be corrected to form a perfect food for stock of all kinds. In the feeding of dairy animals, we adjust the balance of food constituents by adding bran, linseed, and cottonseed meal to the hay or natural herbage. These briefly stated facts emphasize the importance of growing a larger proportion of food bearing a high percentage of muscle-producing or nitrogenous constituents, such for instance as lucerne, peas, vetches, beans, and clover. How far these crops can be profitably cultivated, I am unable to advise. We have peas, vetches, and lucerne growing successfully at the College from seedings made during the past winter, and as crops for forage silage or cured hay they now offer every promise of success. Rape and kale were forage crops which grew rapidly during the colder portion of the year, and from the recent experiences at Roseworthy, they could be most highly recommended. The growing of rape is no experiment, it having already passed that stage. But what can be produced from an acre of land in the form of rape fed to sheep, hogs, or cattle, and sold as meat or dairy products is worthy of a trial, and what a crop of rape suitable for pasturage at the beginning of summer will do to carry the stock through the drought is a hope for partly overcoming the drawbacks of an arid country. There are numerous other plants which have made successful growth in the arid districts, such as the soy beans, cow peas, Kaffir corn, sulla, and sunflowers, and I believe they could be grown successfully in portions of this state. These crops were practical failures at the College last year, as was nearly everything else, owing to the unfavourable season.

My last suggestion is practically a summary of what has gone before. Combine the economical side of farming with observation, study, research, and make every farm a miniature experiment station, and be willing to try new things on a small scale even if you have no great hope of success. Start a patch of lucerne by sowing it on a well-tilled fallow at the time you sow wheat, give it a good chance the first year, and do not pasture it too closely. If you succeed in growing a crop make hay of it, and feed it to one or two cows in comparison with other hay. Give rape a trial as a pasture for sheep, cattle, and hogs. Determine what can be done with this and other new plants by sowing them every month of the year if necessary. I was pleased recently to be asked for a list of books suitable to make a farmer's library. While I have as little faith as the most sceptical in book farming, the books in the list that is being prepared will contain many scientific ideas which in the minds of practical men are sure to evolve many improved methods of farming. They will offer opportunities for study, and it is by observation, study, and invention that we advance.

Mr. J. Sampson (Inkerman) asked if the professor would tell him the difference between Jersey and Guernsey cattle, and if there was any Alderney breed.

Professor Towar did not believe that at the present time there was any such thing as an Alderney cow. Years ago vessels used to sail from the Channel Islands to England from the islands, and the last one touched at, before the mainland was reached was Alderney. Thus they were called the Alderney boats, and practically everything that came from the islands was called "Alderney." There were, he believed, only the two Channel Island breeds, the Guernsey and the Jersey, but he had not seen any of the former here. The Guernsey was the larger of the two animals, and more yellow in colour. The Guernsey in a great many trials in the United States had come out ahead of the Jersey, and, like the other, gave very rich milk and splendid quality butter.

Professor Towar, in answer to a number of other questions, said that in America they were making ensilage without weighting it down, and it kept well. He would not advise them at present to stop weighting the silo here, but just mentioned the fact to show that making use of the weights might after all be an unnecessary labour. As regards the cutting of crops for hay, they should not mow them when they were too green, but before they got too ripe. If they cut them after the concentration of the nourishment of the plant into the seed, they would find the stalks of a woody fibre. The class of horses on the farm in America were no better, and perhaps not so good as those to be seen in South Australia, but the Americans appeared to get more work out of their horses than was the case in this State. He attributed this to the feed they got in the United States being more nutritious. Probably if the farmers here could grow more lucerne they would find their horses work better. In America they appeared to have better carriage horses than those to be seen in South Australia, and he believed this was due to the use of trotting horse sires in America, instead of the racehorse, as appeared to be the case in Australia. The French draught horse, the Percheron, was more generally found on the American farms than the Clydesdales. It was a little lighter, and more active for general work on the road. The Percheron was a little after the style of the Suffolk Punch. At Roseworthy College rape had been sown on different parts of the farm almost every month since February. He had sown rape yesterday in valley ground, and even if it did fail on account of being put in so late, the loss would only be 2/ per acre, while if favourable weather prevailed, it would provide feed into the summer, although some insect pest might come along, as it sometimes did, and destroy the crop. The Jersey shorthorn cross was known as the farmer's cow. To him it seemed like going against Nature. He had heard that this method of breeding was adopted in South Australia, and had a good many advocates, but he did not believe in it himself, nor would he until he was thoroughly convinced that such a practice was successful. The Hungarian grass had to be grown in summer, as it succumbed to the first frosts. It grew quickly, and might make a fair crop if the seed were sown immediately after the danger of frosts had passed, and reasonable amount of rain was likely to follow. He had had no trouble at the College in the way of sheep not eating rape readily. Where there was other feed with rape, possibly they would take the former before they paid their attention to the latter; but they would eat rape long before they starved. (Laughter.) He had fattened lambs on rape and nothing but rape. Dwarf Essex was the best kind of rape, and would give a good crop if sown in March. Lucerne would not do so well growing with some other crop as by itself. He believed in sowing lucerne early, so that it could get the full benefit of the winter rains. At the College they had sown several acres with it on May 13, and although several severe frosts had been experienced this winter, it was growing nicely now, and a good crop could be cut from it. Rape was not a good crop for ensilage as there was too much water in it. It was suitable only as forage. Peas were desirable for ensilage, and did well mixed with oats or other crops for this purpose. Lucerne or any other of the leguminous plants would improve ensilage. Some waters would do for the growing of lucerne by irrigation, others would not. Some men also said a person required to know whether the water and soil would work together before they could tell if the locality were suitable for lucerne. The better grasses for pasture included cocksfoot. The Timothy was also an excellent grass, and made good hay. He had seen it growing in a few places here, also the Italian rye and oat grasses. In sowing superphosphates with rape or sorghum, he would not take into consideration the risk he ran as regards the fertilizer killing the seed owing to being in contact with it. There was not much danger, and he advised them to put the seed and manure into the ground in the best way that suited them. Very tender shoots of wheat on coming into a spot where the phosphates were especially thick died off, but only a comparatively few were thus affected, and they always sowed many more grains than were necessary, as they had to allow for a good many of them being destroyed. He was not prepared to recommend putting the so-called insoluable phosphates in the soil, but in certain cases where the ground indicated that it would pay better, the farmer would be justified in adopting that method. They should be able to grow good lucerne with a rainfall of 15 inches. The seed should not be covered deep. He thought half an inch sufficiently deep for lucerne. (Cries—"Too deep," and a delegate interjected—"I simuply roll it down." Professor Towar preferred not to roll the ground; he thought the better plan was to cover with a light harrow and leave the ground rough. The Holstein cow was not reared in such a country as South Australia. It was rather handsome looking if they liked colour, and provided an immense quantity of milk, but of a low standard. What it lacked in the quality of milk it made up in quantity. They wanted the best conditions that prevailed, and there was the possibility she might fail to come up to expectations in a dry climate. The question as to whether she would be suitable for a farmer's cow in this State, he would answer as he had done other queries, namely—"You will have to find the matter out for yourselves."

The Chairman asked if Professor Towar thought it were possible for women to receive instruction at the Roseworthy Agricultural College.

Professor Towar said he had already reported to the Minister on the matter. The report set out that there was no reason why women should not be able to go to the College as day students to attend the lectures on dairying, horticulture, and possibly on some agricultural subjects. In the United States the course of instruction for women at the agricultural colleges was on somewhat the same parallel as that of the young men. The women sometimes took a special course in dairying, and went through all the work from the weighing of milk to the manufacture of butter. In these dairy schools it was found that the girls were just as good, if not better, students than the boys. The system started in a small way in America, and at first farmers' daughters living near the colleges used to be driven to the institutions each day for studying in some particular subject such as dairying.

Mr. A. Molineux moved a vote of thanks to Professor Towar for his excellent address, and his courtesy in answering a number of questions. With regard to Medicago media (or sand lucerne), it was a hardy plant, and had been grown on Yorke's Peninsula, but the attention which it deserved as a fodder crop had not been paid to it.

The motion was carried with acclamation.

Thursday Morning, September 10.

DAIRYING.

Mr. J. Miller presided over Congress in the absence of Mr. R. Caldwell, and called on the Dairy Instructor, Mr. G. S. Thomson.

Mr. Thomson said:—"I am not going to give you a long address, but four short ones, to allow you plenty of time for discussing each subject.

I have chosen for the first part of my address a subject that will afford considerable scope for discussion, namely, "The home separator and the quality of butter." We are told that the cream separator is to a large extent responsible for so much inferior butter being produced in Australia, and in some parts of the Commonwealth severe measures have been proposed to limit the use of machines. Those who are not so drastic in their views associate the separator with the present high position dairying has attained, and in many districts it has been demonstrated that failure in agriculture would have followed its absence from the farm. It is beyond dispute that defenders of the separator have a very strong argument in its favour when they recall the struggling days of the industry, when hand-skimming was the system in vogue, and was productive of butter far behind in quality the average of to-day. It has been said that Australia is the dumping ground for separators, and that other countries are poor patrons of the large manufacturing firms in England, Sweden, and elsewhere. There is certainly something to say in favour of the very large sale of machines in the Commonwealth, when it is considered that great advantages are derived on the farms remote from butter-making establishments. It seems unfair to continually condemn the instrument that has practically raised the export butter trade of Australia to its present great dimensions. Is it because we are afraid to attack the source of the evil, namely, the abuse of the separator? I am in a position to speak from personal observation that extensive supplies of deteriorated cream are sent to factories of convenient situation to farms, and this happens not only in the hot weather, but throughout the cold months of winter. I ask the question why should that very serious state of things continue? It is because dairies are not kept as they ought to be, separators are not treated as separators, and the cream is injudiciously collected, mixed, and conveyed to the factory when old and tainted. I think it is the duty of the female dairy hands to do a little more to safeguard the interests of the butter industry of South Australia. It is a woman's work to attend to the utensils, the cleanliness of the milk or cream rooms, and to interest herself in all that is conducive to the manufacture of choice produce. That many machines are in the hands of dairymen residing within a mile or so of creameries and factories cannot be denied, and a reason for this is not difficult to find. Universal dissatisfaction over supplies of separator milk returned to the farms has kindled the farmer's desire to purchase a separator for his own use. The virtues of the machine have been thoroughly brought before his notice most important of all being the great advantage of having a sweet and wholesome supply of skim milk for feeding calves and for other purposes. Rapidly the sale of separators increased. The efforts of the factories to check their numbers were of little purpose. Soon the farmer was independent of his nearest factory, and where unpleasantness continued he sent his supplies where he considered better results would be obtained. Rivalry amongst factories followed, and deeper and deeper did the mischief grow that distance appeared to be no objection to the transit of cream and profitable returns. Where are we now? The cry is raised, can we abolish the hand separator? I contend—and it has been my view from the outset of my appointment here—that as the separator has gained a permanent footing in South Australia it is our duty to give our attention to making the best use of it.

Mr. Thomson announced that that was the conclusion of the first portion of the paper. The delegates would be allowed 20 minutes to discuss the questions that had been raised therein. He asked for a show of hands to ascertain how many delegates were in favour of the use of the home separator.

There was a large show of hands in favour of its use, and one against it, while a few delegates remained neutral.

Mr. Thomson—That will do, gentlemen; there is a large majority in favour of the use of the separator

Mr. P. Pavey (Crystal Brook) said that some farmers who owned home separators and lived near factories did not send their cream to those establishments but to factories a considerable distance away. The reason was attributed to these persons being jealous of others, whom they said received better treatment than was accorded them. He could hardly believe that men could be so jealous.

Mr. Thomson said they should attack the most serious of all evils—the abuse of the separator. Some of those who use separators were very careless in regard to cleanliness. He had been told that some only cleaned the separator once a day and worked it twice. Was it possible under those conditions for the cream to keep its flavour? Cream was also kept too long on the farm. It had been kept four, five, and even six days, not only in winter, but in fairly hot weather. Was it possible for cream kept so long to arrive at the factory in a sweet wholesome condition? Only an inferior product could be made at the factory with such cream. This was his reason for the statement he had made in regard to the abuse of the separator being the most serious of all evils It was for them to express an opinion

Mr. P. Pavy (Crystal Brook) considered that the cream should be graded on the farm or at the factory. The factory manager should be competent to grade cream into a first and second-class article, and pay for it according to its worth.

Mr. Thomson said that the evil took place on the farm, and that if the cream arrived at the factory in a bad state then the farmer was responsible.

A delegate—That is where the jealousy comes in.

Mr. Thomson asked if the factory manager should grade deteriorated cream and only pay for it at its proper value.

Cries of "Yes."

Mr. Thomson—"Well, that is all right."

Mr. J. Malcolm (Kadina) stated that if farmers had rusty wheat the buyers of it would grade it and pay for it only what they considered a proper price. Cream should be graded in the same way as was done in the case of wheat and chaff. Then the farmer who did not look after his cream would have to take a lower price. He was in favour of every farmer having a home separator as it brought about a saving in time and expense. It would be wise for the farmers to co-operate in this matter. If they acted in co-operation more than they did at present they would find it was to their mutual advantage.

Mr. W. E. Fisher (Tatiara) agreed with Mr. Thomson's remarks on the cleanliness of the separator. He knew a housewife who owned a separator and always put soda in the water to clean it. At his home they separated the cream and made their own butter throughout the winter. They usually got a little more for it than other butter. When the hot weather set in they sent the cream to Adelaide and had no reason to complain about the price they received for it.

Mr. J. Wilson (Petersburg) said he had been asked by the manager of the Petersburg factory to bring forward the matter of supplies of cream to the factories. It was argued that all farmers could take their cream to the factories in first-class condition, but all had not the proper knowledge as to how to do this. The Government should appoint a dairy inspector and instructor. (A Voice—"We have one now.")

Hon. T. Pascoe, M.L.C., agreed with Mr. Thomson's remarks on the matter of cleanliness. His boy objected to a separator because he went to a neighbouring farm where there was one that did not smell very nice. However, he got a separator, and the advice of the firm from which it was purchased in regard to the scalding out of the machine after every time it was used was followed. But it was found that the hot water burst a little indiarubber ring, and the "whole show went bung." He found that it would not do to pay 6d. a week for the purchase of indiarubber rings, and so he had designed one of his own which had worked satisfactorily ever since. His advice to them was that they should not mix two lots of cream until they were cool.

Mr. W. H. Marshall (Eudunda) said he had listened to Mr. Thomson's remarks with mixed feelings. The statements made appeared to be adverse to South Australia, and represented the residents as being a dirty lot of people. The women folk were not there to defend themselves, so he would look after their interests. The district of Eudunda was famed for its butter and cream, and that would not be the case if the women folk there were dirty. They would remember that the criticisms of a gentleman from Russia on the dairying industry met with much disfavour. He did not think it wise to make statements which would appear in the press to the effect that our manipulalon of the separator was done in a dirty manner. It would be a pity if such an announcement went out to the world, as it was only true of a few individuals. Co-operation met with his entire sympathy. If cream were graded and paid for according to its value the creameries would be in a better position than they were at present.

Mr. S. Challenger (Mount Remarkable) admitted that there was a large number of people who were not over clean. Nobody could keep cream in good condition without a properly ventilated and clean dairy. Plenty of them had clean dairies, but they lacked proper ventilation. Dairy buildings facing east and west did not carry enough ventilation; they should be built north and south. If there was a ventilator in the roof, then there should be one in the bottom of the building north and south. Then they would find their cream keep cool. The separator should first be cleaned with cold and afterwards with hot water. All people engaged in dairying did not appear to know this.

Mr. F. Coleman (Saddleworth) said he had been told by a factory manager that apart from cleanliness, considerable trouble was caused by "weediness" in butter. It was most essential that the separator should be kept clean.

Mr. F. Bayne (Pine Forest) said that butter would keep better at one time of the year than another, and wished to knew the cause.

Mr. Thomson said that "weedy" butter, more especially in the north, was very common at that time of the year. Certainly they wanted to get over the trouble, but he was afraid it would take some time. Undoubtedly by cooling the cream to a low temperature they got rid of the weedy flavour to some extent, but the refrigeration of cream could not be undertaken on most of the farms in the north. Some people used a pinch of saltpetre and a little warm water to reduce the taint, but it was questionable if sufficient benefit was secured by the adoption of such a practice. He had experimented in his laboratory in this direction, and had found that the saltpetre and warm water had taken away a little of the taint by evaporation.

Mr. A. S. Hughes (Woodside) had found the plan of cooling milk beneficial. When the cows were fed on rape, the milk from them was put through the ordinary cooler twice, and by this means a lot of the taint, but not the whole of it, was taken away. If farmers would only cool their milk directly it came from the cows, they would reduce the taint considerably.

Mr. J. Phelps (Dowlingville) said he fed his cows on a little bran and as much salt as he could get them to eat during the "weedy" season, and he found that the objectionable taint was taken out of butter to a considerable extent in that way.

At the request of Mr. Thomson, a show of hands was called as to those who were in favour of grading cream. Nearly all voted in favour of such a system, and no delegate voted against it.

Mr. Thomson—In my second paper I will deal with the dairy cow. The pure Jersey cow I cannot altogether recommend. Is she suitable for the butcher? Is she an ideal cow for the farmer of South Australia? To a certain extent she is, as regards butter making but nothing else. In my opinion she is the gentleman's cow. Take the shorthorn. She is a big, heavy-framed animal, which carries fat. We are not dealing with the animal as a stall fed one, but on its average weight. She gives a lot of milk, and to some extent the quality is good. Shorthorn cows have given 600 gallons of milk each in a year, and we have got crossbreds of the breed in South Australia which have given that quantity. In one of the largest cities of Scotland I have seen nothing but shorthorns, and the owners are able to sell their cows to the butchers after they have done with them. The shorthorn puts fat on in the right place—on the ribs, not in the intestines, as in the case of the Jersey. I do not wish to discredit the Jersey, however. Cross the Jersey bull with the shorthorn cow, and we get a splendid dairy cow, which gives a large quantity of rich milk and has a bigger frame than the Jersey. At the Tring test held in England last year, the shorthorn achieved an easy victory over the Jersey and other breeds of milking stock, and there was a very strong demand for the shorthorn milking strains for export. At the Melbourne Show the other week, a mongrel shorthorn gained the highest honours as a dairy cow. We have other breeds, such as the Ayrshire, of good milking cows, but the percentage of fat in the milk is somewhat low. It is questionable whether it would be advisable to cross the Ayrshire with the shorthorn, as the percentage of fat in the milk of both is considerably below that of the Jersey. The Holsteins are handsome big heavy cattle, something of the size of shorthorns, but quite different in colour, the breed in its native country is a very heavy milker, but the quality of the milk, however, is very low. The Holstein carries a lot of flesh, and is a fat big-boned animal. I do not know if the experiment of crossing the Holstein with the Jersey or any other breed has been tried. I think success would follow the cross between the Holstein and Jersey. (Cheers.)

Mr. W. H. Marshall (Eudunda) asked if it were advisable to put the Jersey bull to the shorthorn cow in breeding.

Mr. Thomson—Yes.

Mr. A. Molineux asked if Mr. Thomson thought the Holstein breed would prove serviceable in the north?

Mr. Thomson said he did not think so. He saw 300 on one farm in Sweden, and they were revelling in rich food and well attended to. He was afraid that the northern parts of South Australia would not be suitable for the breed.

Mr. A. S. Hughes (Woodside) considered that the cross between the shorthorn and the Jersey was the best. The shorthorn came on top repeatedly at the Sydney and other shows. He would like to ask Mr. Thomson if the Ayrshires in their native country carried short teats, which caused a lot of trouble in milking here. The purebred Holstein wanted deep marshy country with plenty of rich feed and would not do on the Mount Lofty Ranges.

Mr. F. G. Dawson (Burra) asked in respect to the Jersey-shorthorn cross if Mr. Thomson was speaking of the milking or fat strain of shorthorns?

Mr. Thomson said he certainly referred to the milking strain, if they could get them, but if not, they could use the other strain of that breed. He thought there were some herds of milking shorthorns, but not the pure, in South Australia. He had seen within the metropolitan area of Adelaide some dairy cows as good as he had seen in any part of the world. In different parts of the State the value of the shorthorn had been clearly demonstrated. In regard to the question asked by Mr. Hughes, when he was a boy the Ayrshires were bred in Scotland very much for show purposes, and as the judges then preferred short teats the farmers bred their cows accordingly. At that time people in South Australia were importing Ayrshires, and therefore got animals with short teats. When he visited Scotland recently he noticed that the teats of the Ayrshires were much longer than previously, and that the judges favoured long teats.

At this stage Mr. Caldwell took the chair.

Mr Thomson, in answer to a question, said the Guernsey was a larger animal than the Jersey. The Guernsey's colour was an orange pink, while that of the Jersey was fawn, some being dark fawn. The Guernsey was a better cow for the dairy than the Jersey, as it had more weight, gave more butter fat, and put on flesh more rapidly. The butter produced from its milk, like that of the Jersey, was very rich.

Mr. T. H. Casley (Mount Remarkable) said his views were opposite to those of Professor Towar. He had bred both the pure and the cross animals, and he thought that Mr Thomson had arrived at a correct conclusion in deciding which was the best dairy cow for the farmers.

In answer to a question, Mr Thomson said that in breeding from crossbred animals they must have a purebred sire.

Mr. Thomson—The third portion of my paper, or address, will deal with variations in the returns of butter from cream. A farmer sends, say, 10 gallons of cream to the factory and retains 10 gallons for treatment on the farm. He gets more butter from the quantity he churns himself than is procured at the factory, and reasons with himself that there must be something radically wrong. He must, however, among other things, take into consideration the consistency of the cream. There must be the same percentage of fat in the cream he sent to the factory as that retained in the farm by him The cream churned at home and that churned at the factory should be exactly similar for such a test. The acidity of the cream had also to be taken into consideration. Perhaps we would find that the cream kept at home was churned at a temperature of 60 degrees, while that sent to the factory would be treated at a slightly different temperature. The quantity of cream churned was also another point that must not be overlooked. Take two churns and put 50 gallons of cream in the one and five in the other and a different percentage result will be obtained. Cream, unless it breaks at the proper time, will not give up a quantity of fat. Then, again, the washing, working, and salting will make a difference. All these matters have to be taken into consideration before you can charge a factory with giving short returns. Another point of great importance is that of the transit of the cream from the farm to the factory. You have also to consider the quantity of cream dispatched in the cream cans. If the weather is hot and the cans become heated by the sun the cream will develop acidity. Vibration, it is well known, causes the formation of butter grains, and when this happens the result is the loss of a lot of butter in the churning process. If you have cream at the stage of giving up the butter grains the least shaking of the cream can for five or 10 minutes is sufficient to break the grains. I have seen on the surface cream in cans inches of butter and below that skim milk, and a great deal of the fat has been lost with the skim milk. You can easily see that when farmers churn their cream at home they do so under more favourable conditions.

The Chairman said he had seen cans in New Zealand the lids of which moved up and down according to the quantity of milk or cream in them. The lids considerably reduced the tossing about of the contents of the cans..

Mr. Thomson thought the cans with their patent lids would be of great service to the industry if they were as serviceable as appeared from Mr. Caldwell's remarks. He had carried out an experiment in the north for reducing the temperature of a can of cream. Water was made to drip on a canvas covering all night and the cream was kept in splendid quality, but, of course, such a method could not very well be adopted for the farm.

A delegate asked which was the best time to churn cream—in the morning or evening?

Mr. Thomson said he would have to gauge his time according to the acidity of the cream. It was an importaint point, as butter making depended upon the ripening of the cream The working of cream into butter was a simple process, but on the proper ripening of the cream depended the success of the whole operation. To test the cream take a little from a can with a spoon and taste it. If they find that the cream has a sharp taste of acidity at first followed by a pleasant sweet taste, then it is ready for churning. If the taste of acidity is more pronounced and no sweetness follows, it is too far advanced for making good butter; and if there is too much sweetness the time for churning has not arrived. (Hear, hear.)

The Chairman asked if Mr. Thomson favoured the use of starters in the cream.

Mr. Thomson said that in Denmark 98 per cent. of the cream was pasteurized, and that killed all the organisms in it. The cream was then in the best condition for the introduction of the starters. The starters ripened the cream after it had been cleared of all injurious organisms. In Denmark the starters were used at the factories to which the farmers took their cream. The Government there looked after these organisms, and if a factory manager was afraid his particular culture had been contaminated, he would send it to the Government for examination. If it was found to be all right he would continue to use it. Pasteurization would do away with weediness in cream. Scalded cream did not make good butter; it was better to scald the milk.

Mr Thomson—My last remarks will deal with the export butter trade. This season we started the export of butter three weeks ago, and in the first week we shipped about 160 cases. That quantity was "surplus" butter and the question I wish to ask you is this: In the shipment of low grade butter would it be beneficial to the export trade to grade it and mark it with a "pastry" stamp? If you decide that it was desirable to do so, then the question would arise as to what stamp would be most suitable. Some years ago I introduced the practice of marking low grade butter with a stamp, and people found fault with me, accusing me of injuring our export trade. What I did was for the protection of the industry. I am told that if we brand boxes of pastry butter simply with printing ink, little difficulty will be experienced by dishonest people in London in removing that brand. Was it advisable to use a hot iron so that the brand could not be removed? Are you in favour of that?

Mr. J. Malcolm (Kadina) moved: "That it be a recommendation from this Congress to the Government that all butter exported be graded and branded accordingly, and that the name in the case of pastry butter be burnt into the box containing it with a legible fire brand."

The motion was carried unanimously.

Mr. T. Gravestock (Riverton) said he had a cow with warts on the teats. He tried soda and warm water to take them away, but they did not disappear. Now he was washing them with warm water and castor oil, but was afraid he would not be able to get rid of them by such treatment.

Mr. Thomson informed him that he should have dealt with the warts when they were in the early stage. He should have tied gut around each wart and cut them away in that manner. It was too late now to do so, and he could not remove them without doing serious injury to the animal.

Mr. Thomson was accorded a hearty vote of thanks for his address, on the motion of Mr. J. Malcolm.

Thursday Evening, September 10.

On Thursday evening, Mr. Walter Gill, F.L.S., F.R.H.S., Conservator of Forests, gave an exceedingly interesting address on forest work in South Australia. A large number of views of timber trees were shown by means of the limelight lantern. These included both indigenous trees and pines and other imported varieties planted by the Forest Department. With each view Mr. Gill gave an interesting description of the characteristics and value of the particular class of tree. Among the pictures were several showing 30 ft. piles for jetties, telegraph poles, pine timber cut for fruit cases, date palms at Hergott and Mount Brown reserves.

In reply to question, Mr. Gill said his experience was that the best time to cut timber for fencing, &c., was when the sap was down. This was most easily ascertained by the condition of the bark; if the tree is easily barked, the sap is still up, but if the bark will not run, the tree is in a fit condition for cutting. The time of the year would of course depend both on locality and the different classes of timber.

On the motion of Mr. J. Malcolm, of Kadina branch, it was resolved:—"That this Congress greatly appreciates the work of the Forest Department, and is of opinion that more liberal funds should be provided by Parliament for the extension of forest work."

A hearty vote of thanks was accorded Mr. Gill for his address.

Friday Morning, September 11.

FREE PARLIAMENT.

Mr. Caldwell occupied the chair, and there was a large attendance of delegates.

WATER RUTS.

Mr. J. Wilson (Petersburg) brought forward the question of "the best method of stopping and preventing water ruts on cultivated lands." He said he had noticed large ruts washed in the cultivated lands in the middle north by flood waters. Judging from what he had seen on his way to Adelaide some people in the north appeared to have attempted to prevent deep ruts being washed into the land, but had not been very successful. He thought it possible that some of the delegates could inform them of a satisfactory method of preventing this waste of land. Some people had stopped up ruts with stones and straw, but storm waters had washed all away and left the ruts larger than ever. Mallee boughs, he had been told, were of use for such a purpose, but they were scarce in many parts.

Mr. J. O'Loughlin (Morchard) thought that several embankments, two or three chains apart, would prove serviceable in preventing deep ruts and in damming back water for irrigation or other purposes.

Mr. T. Smith (Port Germein) considered that the ruts were caused by the flood waters from the hills during storms in December. He had noticed that in some places the ruts were half a chain wide.

The Chairman said he had had considerable experience with ruts on his own property and in connection with a district council Where he lived they had a rainfall of 37 in. He had noticed water cutting into the soil more during the last three years than previously, and attributed this to the removal of timber. The only plan he had seen successfully adopted was the inducement of growth in the ruts. He had seen furze cultivated in the ruts, and soil settled around the roots and was held there by them.

Mr. J. Wilson (Petersburg) asked if it would be advisable to plant grasses in the ruts?

The Chairman thought that the planting of furze bushes would prove of more benefit.

Mr. W. Pearson (Meadows) believed that the only practical plan to deal with the trouble was to make a study of the drainage of the land, and plough across the contour, so that there was as slight a fall as possible, while here and there they could put a cross furrow to carry off the water to the lower levels. It was a good plan to keep the furrows clear of loose soil, stones, &c., to give the water a clear run, otherwise it would break over the sides and wash the land badly. The evil would be lessened if they studied the gradient as much as possible. He thought the planting of furze would be one of the worst plans to adopt. Furze was a curse to the hills residents, and wherever it had been planted on the watercourses it had spread over miles and miles of country.

The Chairman said he recognised that furze was very objectionable so far as the Mount Lofty Ranges were concerned, but it might prove exceedingly serviceable in the north, where they had deep ruts.

SALT PATCHES ON THE FARM.

Mr. W. H. Marshall (Eudunda) stated that several farmers living in the district east of Eudunda had found during the late drought that the "salt patches" on their properties had extended in area, and they would be pleased to know how to overcome the trouble. One landholder had given the land a good dressing of stable manure one season, and the result at first was satisfactory, but he found that the soil soon required further treatment. Some farmers had tried gypsum, and found it answer fairly well, but others reported that its use had not given satisfaction. He suggested that where there was a fairly large patch of this salty country they should grow mangolds on it. This root crop was likely to do well on such land and to take the salt out of the soil. He was also going to experiment with the growing of saltbush on this land. There were also salt patches on Yorke's Peninsula and elsewhere spoiling considerable areas of what was formerly valuable land.

Mr. F. G. Dawson (Burra) said he had had a limited experience with salt patches. They differed from those mentioned by Mr. Marshall, as they came in the wet and not the dry seasons. He had tried the growing of saltbush on these patches, but it had been killed, even after it had lived a season, by frosts. He was growing mangolds, and thoroughly believed in them, but they should be supplied with plenty of manure.

The Chairman pointed out that Mr. Dawson was speaking of country that had an altitude of 1,500 ft. above sea level, while Mr. Marshall referred to land only 50 ft. above the sea. He thought there were some varieties of saltbush that would resist frost.

Mr. W. H. Marshall (Eudunda) stated that he had found saltbush a summer fodder plant, and he thought it might do better in the Burra district if sown at the proper time of the year.

Mr. F. G. Dawson (Burra) did not think the planting of it at a certain time in his case would have made any difference, because the bushes had lived over one season.

Professor Perkins said that he had been giving some attention to this matter lately, and at some future time he might be able to give them the benefit of his experiences on the subject. Certain manures, as pointed out, might be of benefit when applied to some salty patches of land, but would be of no service in respect to others. That was on account of the salt being in the soil in different forms. For instance gypsum might prove valuable in treating some soils, but would be practically useless on salty spots on Yorke's Peninsula, where the common salt predominated. This difference in the forms of the salt in the soil also accounted for the areas of salty land extending in some localities in the winter months, while in others they were more pronounced after dry seasons. If on such land they could grow any kind of plant that would keep the salt from rising, or prevent the extension of the affected land, they should adopt such a practice; but if they could grow mangolds or some other directly salt absorbing crop on the land it would be so much the better.

SHORTAGE IN THE WEIGHT OF MANURE.

Mr. J. O'Loughlin (Morchard) moved—"That it is the opinion of this Congress that farmers should insist on having the proper weight of the manure for which they pay." As a rule when commercial manures were bought, a certain number of bags represented a ton, and on the farmer carting it home he found that there was a shortage in the weight. Something was required to be done in the matter; the merchants should be made to supply the proper weight. The subject had been discussed at a meeting of the Morchard Agricultural Bureau, and he had been requested to bring it before Congress. The manure should be sold by weight, and not by a given number of bags.

Mr. J. G. Foster (Narracoorte) declared that he had found a shortage of 200 lb. in a ton of manure purchased by him.

Mr. W. H. Marshall (Eudunda) believed that some of the manure was short-weight when shipped, the idea being that it would take in moisture on the sea voyage, and thus the weight would be increased. But the conditions that prevailed sometimes did not allow of this taking place, and a shortage of weight was the consequence. Farmers already purchased the manure by the ton.

Mr. J. Malcolm (Kadina) considered that the matter was entirely in the hands of the farmers. If they felt that they were not getting the proper weight, they should refuse to receive the manure. They should only pay for what they got.

Mr. S. Small (Kadina) said that difficulty was experienced in arriving at the proper weight of the manure. The purchaser had only a few hours in which to take delivery of the manure on the arrival of a vessel in port, and consequently had not sufficient time to weigh it. He suggested that the Inspector of Fertilisers should weigh the manure.

A delegate—"He cannot do that. The work would take him all day and all night."

Mr. Small said the inspector might weigh a bag here and there, which might lead him to decide whether there was a shortage or not in a shipment.

The Chairman said they could not ask the Inspector of Fertilisers to undertake such work.

The motion was carried unanimously.

MANURE FOR LUCERNE.

Mr. A. S. Hughes (Woodside) asked when was the best time to apply manure to lucerne—in the autumn, winter, or spring? He wished other members would tell him of their experiences.

Professor Perkins said Mr. Hughes should state what manure he intended using. Lucerne practically never required nitrates.

Mr. Hughes stated that he was going to use bone phosphates.

Professor Perkins said that if that were the case, the sooner he put the manure into the soil the better. Bone phosphates, like some other manures, remained in the soil until the plants used it. They, however, had to take into consideration the fact that when lucerne was not growing, the manure might be used by weeds. On certain soils, especially heavy land, the application of gypsum had a very beneficial effect; such plants as lucerne and clover showed a marked improvement where gypsum was used. The best time for putting in the manure, under average conditions, was early in winter, but the residents of different places had to adapt themselves to their own conditions. Where lucerne was irrigated, he thought that soluble manures could always be profitably applied immediately after a cut, and just prior to irrigating. It would serve to give the new growth a good start.

Mr. A S. Hughes (Woodside) asked what was the best manure for a heavy clay soil.

Professor Perkins said that his impression was that Thomas phosphate would prove of great service in soils apparently deficient in lime.

Mr. W. Pearson (Meadows) declared that he had lucerne growing splendidly on a black, heavy soil. He thought August a good time for applying the manure. When the weeds began to grow, they should go over the land with harrows, give it a good scratching, and apply the manure.

THE BEST MANURE FOR DRY DISTRICTS.

Mr. S. Thomas (Amyton) asked what was the best manure for dry districts? He had had no experience in the matter, but knew that some trials with various manures had been carried out in his district. The results, however, had not been very encouraging. The rainfall of the district varied from eight to 18 inches.

Mr. R. Campbell (Millicent) thought that farmers in the Amyton district would find green manuring very beneficial. (A delegate—"The rainfall is not sufficient.") He believed that if there were sufficient rainfall for wheat, there would be enough to start peas into growth.

The Chairman considered that Mr. Campbell's remarks demonstrated how difficult it was for persons living in favoured spots of the State to give advice to those who had their homes in dry districts.

Mr. W. H. Marshall (Eudunda) said that in February, 1903, The Journal of Agriculture published an account of experiments with 11 different kinds of manure at Eudunda, the rainfall from seeding time to harvest being 7 in.

Mr. J. Malcolm (Kadina) said that when he fallowed his lands on a certain occasion he reaped 10 bushels to the acre, but from the land that had not been fallowed the return was only two bushels an acre. In both cases he used manures. The fallowing should be carried out in time to get the benefit of the early rains.

THE DUTY OF DELEGATES.

Mr. R. Thompson (Quorn) said that as the Government paid for the railway fares for two delegates from each branch to attend Congress, it was only fair that the two delegates representing each branch bureau should attend half of the sittings of Congress. (Hear hear.) They could not fairly expect them to be present at every meeting, as some of the delegates had business with the Government when they came to the city. He was afraid when they looked at the attendance at the Congress they must admit that some of the delegates who came to Adelaide for the Congress hardly realized their duty in this matter. He therefore moved—"That it is the opinion of this Congress that those members who accept free railway passes from the Department of Agriculture should attend at least half the meetings." He felt sure that if the motion were carried the attendance of delegates in the future would be larger than at present.

Mr. F. G. Dawson (Burra) seconded the motion.

Mr. J. Malcolm (Kadina) said there were over 100 branches in the State and if there were two representatives from each the delegates would number 200. The delegates should be asked to sign a roll, and then they would be able to ascertain the names of those who did not attend the meetings. Surely it would not be asking the delegates too much if they requested them to give the whole of their time to the meetings. If they accepted free passes he held that they came to the city on Bureau business and not any other.

Mr. J. G. Foster (Narracoorte) moved as an amendment that the delegates should attend two-thirds of the meetings held.

Mr T. H. Casley (Mount Remarkable) moved as a further amendment that the delegates should be requested to attend every meeting.

Mr. A. S. Hughes (Woodside) did not think that a delegate should be obliged to attend every meeting If one delegate attended one day and the other the next he thought the various branches would have proper representation.

Mr. T Johns (Port Pirie) did not think it advisable to compel the delegates to attend all the meetings.

Mr. R. Campbell (Millicent) agreed with the motion. The S.A. Farmers' Co-operative Union took advantage of the presence of delegates in the city during show week by holding a meeting. That meeting was also of great interest to delegates, and it was a pity it clashed with the meetings of the conference.

Mr J. Miller thought it unfortunate that the Farmers' Co-operative Union meeting should be held while Congress was in progress If possible some arrangement should be entered into to prevent the meetings overlapping.

Mr R. Thompson (Quorn) was of opinion that three meetings were quite sufficient for a delegate to attend.

The motion was carried unanimously.

ADULTERATED CHAFF.

Mr R. Thompson (Quorn) said the adulteration of chaff was a very important matter to the purchaser of horsefeed. For the last two years, with the exception of about two months ago, he had had to purchase chaff to feed his live stock on account of the drought. A man was prosecuted if he adulterated a glass of whisky below a certain standard, but such was not the case as regards chaff. The whisky was adulterated with water, and if they drank a glass of the mixture below the standard no harm would be done. But the feeding of horses on inferior chaff did harm. It was unfair to feed an animal upon half straw, and expect him to do a good day's work. If a man sold hay chaff and headed straw it should be named as such and not "hay chaff." He believed that certain steps were being taken in reference to the weight of chaff, but that was a matter which was of more interest to the city trade than to them. When chaff was as low as £2 and £2 10/

per ton, the trouble was not taken to adulterate it, but when prices rose people had to pay dear for a lot of rubbish in the chaff. He moved—"That in the opinion of this Congress legislation should be provided to protect the general public against the adulteration of chaff offered for sale."

Mr. J. O'Loughlin (Morchard) stated that he represented a portion of the country outside Goyder's line of rainfall. He was one of those unfortunates who had been forced to buy chaff because of the late drought. The chaff, it had been declared, had killed half the horses which had been reported to have died from disease in his district. The inspector who saw the horses knew very well that the cause of death was indigestion through eating the innutritious mixture of hay and headed straw—called hay chaff. They had had to pay £5 or £6 per ton for this so-called chaff.

Mr. T. B. Butcher (Koolunga) was opposed to the proposal. He did not believe in interfering with individual rights. The whole matter rested in their hands. It remained for them to say whether they should buy or receive the chaff. There were times when farmers had to cut hay in an overripe condition. It sometimes ripened very quickly, especially if attacked by rust, and the straw became yellow in colour. Under such circumstances it was difficult for any one to decide whether it was straw or hay. If they took the step proposed that would be injuring themselves. Last year they were glad to get anything to keep their stock alive.

Mr. R. Thompson (Quorn) said he did not object to farmers at Koolunga cutting ripened wheat for hay. There was no harm in that, but if it were only second quality chaff they should not object to take second price for it. His view was that they should not be expected to pay £5 for third-class chaff. The man who cut the chaff knew its true value. He did not object to the sale of headed straw alone if it were sold as such.

The motion was carried by a large majority, only four delegates voting against it.

THE ICE PLANT.

Mr. J. R. Gluyas (Port Germein) said that the ice plant had been spreading at an alarming rate in the Port Germein district. It was more noticeable towards the beach and on the rich mallee ground at Baroota. Some one had suggested the spraying of the plant with a solution to get rid of it, but the area covered by it was very extensive. It was growing so vigorously that it was killing all kinds of feed for cattle. If any other delegates could offer suggestions as to the best way to get rid of the plant he would be pleased.

Mr. T. Smith (Port Germein) believed the ice plant would be a curse to the north. A man who lived in the Hundred of Pirie took the first plant to Baroota, where he placed it in a flower garden, and from there it had spread to the cultivated lands. When a farmer found an ice plant growing on his land he should destroy it at once, because if he neglected to do so he would soon find acres of ground covered with the objectionable weed.

Mr. A. Molineux said the botanical name of the plant was Mesembryanthemum crystallinum. He suggested that a certain day or days should be fixed each year for the simultaneous destruction of the plant by the residents—including boys and girls. The day should be fixed early in the season before the plant bore flowers. There were two kinds of ice plants. One grew upright and the other along the ground. One was a fodder plant and the other a great nuisance.

Mr. J. Malcolm (Kadina) was doubtful whether Mr Molineux was referring to the same plant as that which was becoming a curse in the north.

PICKLING SEED WHEAT.

Mr. N. Clack (Booleroo Centre) read some notes on pickling seed wheat for the prevention of bunt or smut. He found that if the seed was properly pickled in a solution of bluestone the crop was quite free from bunt.

Mr. T. Gravestock (Riverton) said his experience, extending over 45 years both in England and in South Australia, had demonstrated the effectiveness of the bluestone pickle.

CHANGE OF SEED WHEAT.

Mr. C. H. Daniels (Inkerman) referred to the question of change of seed wheat. Was a change of seed desirable, and under what conditions? In some cases no fresh seed was obtained by the farmer for 10, or even 15, years, yet he got satisfactory results. Other growers in the same locality found it best to get a change of seed every few years. Personally, he thought an occasional change advantageous, but they must exercise discretion in securing the seed. He thought that it was better to get seed grown on better soil than where it is to be sown.

Mr. J. G. Foster (Narracoorte) did not think it wise to secure seed from a cold district for sowing in a warmer and drier locality.

Mr. A. S. Hughes (Woodside) advised them on no account to take seed wheat from a dry district for sowing in one that had a greater rainfall.

The Chairman—Dr. Robertson, of Canada, has laid it down as a rule that you can take from a cold to a warm climate, but if you take seed from a warm to a cold place the result is not so satisfactory.

Mr. W. H. Marshall (Eudunda) said he had experimented with different varieties of wheat, and had made a selection of those that proved suitable to the requirements of the district for general use.

A Delegate—If late wheats are taken from the south to the north they are a failure, or partly so. They do not do nearly so well as early wheats sent from the south to the north

Mr. F. Hassam (Hartley) said that two bags of wheat sent from Yacka to Strathalbyn had given excellent results, the change of seed having been remarkably satisfactory.

FARMERS' UNION MEETING.

Mr. R. Campbell (Millicent) pointed out that the meetings of Congress and of the South Australian Farmers' Co-operative Union had clashed this year. For three years this had occurred. He moved that a conference should take place between the Council of Agriculture and officers of the Farmers' Union for the purpose of endeavouring to make arrangements to prevent the clashing of meetings in the future.

The motion was carried unanimously.

HONORARY MEMBERSHIP.

Mr. H. G. Tossell (Maitland) stated that several branches wished to appoint gentlemen as honorary members, and he thought they should be allowed to do so on the lines that had been suggested by the branch to which he belonged. A person who had occupied the position of member for five years should be entitled to be placed on the honorary membership list. Honorary members were allowed to discuss all matters, but were not eligible for office, and would have to subscribe to The Journal of Agriculture.

Mr. T. Gravestock (Riverton) considered that they should abide by the rules at present in vogue

Mr. W. L. Summers pointed out that the matter had already been submitted to the branches, and most of the replies received were in favour of some system of honorary membership.

Mr. Campbell (Millicent) asked if it were suggested that it should be imperative for members after a period of five years to become honorary members. If so, then some of the best members would be struck off the roll.

Mr. H. G. Tossell (Maitland) said what was desired was that members, after serving for five years, should, if they desired, be made honorary members. He submitted a motion to this effect.

The motion was carried by a substantial majority.

VOTES OF THANKS.

The Chairman said that this concluded the business of Congress, and thanked the delegates for the close attention they had brought to the various subjects that had been brought forward.

On the motion of Mr. J. Malcolm, seconded by Mr. W. H. Marshall, a vote of thanks was accorded the Chairman.

AGRICULTURAL BUREAU REPORTS.

Davenport, August 20.

Present—Messrs. Trembath (chair), Lecky, Hodshon, sen., McDowell, Roberts, McDonald, Hewitson, Tickle, and Pybus (Hon. Sec.).

Cape Tulip.—It was decided to ask the Department of Agriculture for specimens or description of the poisonous Cape tulip. [An illustration and description of this weed appear in the September issue of The Journal of Agriculture.—Ed.]

Seed Potatoes.—Mr. Hodshon complained of the uneven samples of seed potatoes sold by seedsmen and others. Some were practically useless for seed purposes, especially the small ones. He found that the medium-sized potatoes were best for planting. As a rule, he did not like cutting the setts, as they were more liable to rot.

Paspalum Dilatatum.—Mr. McDonald read cutting describing the qualities of this grass, and also Millium multiflorum. The former was a wonderfully rich and vigorous grass, especially on good land. The other was coarser, but would probably be worth cultivating in the dry districts, as it grows well in the winter months. Mr. Pybus had the Paspalum growing in his garden. It stooled well, and was very hardy; but, in his opinion, was too coarse under local conditions to be of much value for fodder.

Dairying—Mr. McDonald read a paper on dairying, and some discussion ensued on the different breeds of cattle.

Shrivelled Wheat for Seed.—This subject was also discussed, and the absurdity of expecting shrivelled wheat to produce good crops under ordinary conditions was dwelt on. Mr. Hewitson suggested that it would be a wise plan to establish experimental plots in the north, where thoroughly sound and acclimatized seed could be grown. Members generally agreed on this point, but thought there was no chance of getting the Government to take the matter up at present.

Elbow Hill, September 2.

Present—Messrs. H. Dunn (chair) Rehn, Harvey, Wake, Hay, Pike, Elleway, Robertson, Spence, J. and W. Ward, G. C. Dunn (Hon. Sec.), and four visitors.

Farm Economy.—Mr. Rehn read from Journal of Agriculture a paper on this subject. One member stated that, while he agreed in the main with the writer of the paper, he found he could not always adopt the practices which he believed best. Mr. Robertson thought farmers should express their candid opinions on the implements they were using, in order to give those about to buy the benefit of their experience. . A long discussion took place on the respective merits of the different seed and fertiliser drills, from which it would appear that the main objection is damp manure, which will prevent any drill working well. Most of the members favoured a space of seven inches between the tines. Mr. Wake did not consider it profitable to buy new machinery when the old could be made to do the work as well.

Red Rust.—Seven wet days were experienced during August, and red rust has made its appearance in some of the crops. One or two farmers are cutting the rusty crops for hay.

Renmark, August 6.

Present—Messrs. Showell (chair), Geneste, Johns, Turner, Nuthall, Evans, Huggins, and Cole (Hon. Sec.).

Fertilisers.—A general discussion on the use of fertilisers took up most of the evening.

Hon. Secretary.—Mr. Cole tendered his resignation as Hon. Secretary. Mr. A. Evans was appointed to the vacant position.

Mount Bryan East, September 6.

Present—Messrs. Dunstan (chair). Quinn, Bryce, Teddy, Dare, Pohlner, Taylor Wilks (Hon Sec.), and one visitor.

Ploughs and Plough Shares.—Most of the members favour using coulters on the ploughs when fallowing, but would fix the coulter on the body of the foot, instead of on the plough. Mr. Pohlner thought steel shares generally were not tempered hard enough, and preferred cast shares.

Feeding Down Crops.—Mr. Bryce reported that a neighbour had fed down a paddock in which two varieties of wheat were growing. The sheep were on the land during frosty weather, with the result that the Steinwedel wheat was dying off in patches, the rest of crop being unaffected.

Foxes.—Mr. Dunstan stated that a fortnight previously one of his lambs had its tongue bitten off, presumably by a fox. The lamb was still alive, and doing fairly well.

Port Broughton, September 3.

Present—Messrs Harford (chair), Whittaker, Gardiner, Barclay, Dennis, Tonkin, and Dalby (Hon. Sec.).

Paper.—Mr. Harford read a paper on the "Farmer and his Friends," which was discussed at some length. The majority present were generally in agreement with the writer, but some objected to the starling being classed as friends of the farmers. [Most farmers on the Adelaide Plains would not hesitate to class the starling as an enemy rather than a friend.—Ed.]

Naracoorte, August 8.

Present—Messrs. Forster (chair), Beunett, Wardle, Caldwell, Duffield, Coe, and Schinckel (Hon. Sec.)

Impaction—Mr. Wardle stated that the mixture used successfully for this complaint was a tablespoonful each of gunpowder, whiting, and sulphur (not saltpetre, as stated in report), mixed with two pints of vinegar.

River Murray.—Some discussion took place on the wisdom of the State spending any money in going to law on the question of the diversion of water from the Murray and its tributaries. The Chairman thought the matter outside the province of the Bureau

Bureau Meetings.—Discussion took place on papers read by Mr. Clucas at Onetree Hill Branch on attendance at Bureau meetings, and by Mr. Rowe at Arthurton on the same subject. Members considered the papers contained useful suggestions for the more effective working of the branches. The Hon Secretary stated that they had tried the question box system, but had failed to get a single question from the public.

Standard Weight for Chaff.—Mr. Coe suggested this subject for discussion at Congress but the Hon. Secretary pointed out that the matter had been thoroughly threshed out previously at Congress meetings, the consensus of opinion being that a legal standard weight for the bag of chaff should be adopted.

Penola, September 5.

Present—Messrs. Peake (chair), Morris, Worthington, Miller, McKay, and Allnutt (Hon. Sec.).

Adulteration of Chaff.—Mr. Morris called attention to the extent to which the adulteration of chaff was practised. Considerable quantities of straw were cut up with hay and sold as prime chaff. It was decided that the matter be brought before Congress.

Lyndoch, September 3.

Present — Messrs. Kennedy (chair), Warren, Woolcock, Zimmermann, Schenke, Arth., Alfd., and H. Springbett, Ross, Reu, Kushall, Burge, and Mitchell (Hon. Sec.).

Cultivation of Vineyards.—Mr. H. Springbett read a paper on this subject. Up to the end of July splendid soaking rains had fallen, but had the land benefited from the rain to the extent it should have? He thought not, for the greater part of it had run off the surface, especially on vineyards on the hill slopes. They all were aware that it was necessary to cultivate the surface soil during spring and summer to conserve the moisture, but he thought that as much, if not more, good would result from opening up the land early, so that the winter rains can penetrate freely to the subsoil, whence they expected their supply of moisture during the summer months. He did not think it would be necessary to use the plough for breaking up the land, as the cultivators now coming into use would do the work, and get over the land much quicker than with the plough. In fact, provided the land was well broken up to a good depth once, he thought the plough could be dispensed with. The first cultivation should be given in May, and the vines on any portion that gets hard pruned first. Then cross cultivate fairly deep, and follow later on by a shallower working. This system would not give such clean vineyards, perhaps; but then a few weeds would do no harm. Under the present system pruning was usually finished first, and ploughing not started till late in July, and continued often into September. The drying winds so often experienced in August cause the land to get very hard, especially after a wet winter, with the result that the plough will not go into the ground properly, and some parts of the vineyard are merely skimmed over Then the land is cultivated several times during the summer to secure and retain a fine tilth. The first good rain of winter sets the surface, and most of what falls after runs away as from an iron roof. Early and deep cultivation would rectify this, and store up supplies of moisture in the subsoil for the vines to draw on in the summer.

Gumeracha, September 7.

Present Messrs Moore (chair), Hannaford, Gall, Jamieson, Hanna, W. A. and A. E. Lee, Monfries, Kitto, and Martin (Hon. Sec.).

Spraying Fruit Trees.—Mr. W. J. Hannaford read a paper on this subject. One of the first and not least important considerations in dealing with the spraying of fruit trees is the selection of the pump and receptacle for the liquids. There were many spraying plants on the market, each having something to recommend it. One important point was the capacity of the receptacle; it should be of such dimensions that it will not need replenishing too often, as this involves a lot of time. In his orchard he used an 80-gallon receptacle set on wheels with bent axle coming within a foot of the ground, and fitted with a good all brass force pump with two hoses each of 60 ft. Each hose is finished with a 10-ft. length of ¾-inch gaspipe fitted with required nozzles. Their main work was confined to checking apricot shothole, apple scab, and codlin moth. For the two former the Bordeaux mixture and for the latter arsenite of soda were the best remedies, though they had undoubtedly a good bit to learn in respect to the treatment of these troubles. The final point is the time of application of the various sprays. In their district he believed they should apply Bordeaux mixture as soon as the flower buds show prominently, and before they are quite open, and again as soon as possible after the fruit is set. The arsenite of soda can be used with the Bordeaux mixture, but must be continued almost up to the time of gathering the fruit. Much injury by codlin moth resulted last year in connection with the Government tests owing to the spraying being discontinued too early. The report of these tests will be found in the July issue of The Journal of Agriculture, and the results afford great encouragement to growers. It has been suggested that spraying frequently with cold water would disturb the moth, &c., and that the Government should be asked to continue the tests for another year or two.

Meadows, September 8.

Present—Messrs. Brooks (chair), Ellis, Stone, Buttery, Catt, and Robinson (Hon. Sec.).

Ringbarking Apple Trees.—Mr. Stone showed branch from apple tree which last year was ringbarked. The whole tree made too much wood, and failed to fruit, so from one branch he took off about half an inch of bark right round, with the result that the limb bore heavily, no other part of the tree being fruitful. After fruiting the branch gave way where it had been rung, possibly owing to too wide a strip being removed. Mr. Stone's orchard is on very wet land, and the trees go too much to wood; he suggested whether by pruning late, after the sap has risen, the bleeding would check the growth and cause the development of fruiting wood.

Draining Land.—Mr. Stone asked whether saplings could be utilized for making underground drains. Mr. Buttery advised using split slabs, and making V-shaped drains, which should have at least a foot of soil above them to allow of the land being properly ploughed. Mr. Ellis stated that 20 years ago he put down a drain with 15 inches of broken stone covered with earth, and this was still working effectively.

Finniss, September 7.

Present Messrs. S. Collett (chair), T. Collett, Chibnall, and Henley (Hon. Sec.).

Poultry.—Mr. T. Collett read a paper on this subject. His experience was that it was better for farmers to keep a few good fowls and feed them well than to keep a lot of birds and let them look after themselves. He found the Minorca the best for laying; they were hardy, and if hatched early and properly fed will lay fairly well during the winter. From 32 hens he sold eggs to the value of £4 5/5, from 1st March to 30th July, besides using a fair number for home consumption. During June, when so many poultry keepers get scarcely any eggs he sold over 28 dozen from his few fowls. He found it a good practice to give oats and barley occasionally, as a change from wheat. A plentiful supply of good water and sharp grit were essential. Some crushed bone should be given occasionally.

Wilson, September 5.

Present—Messrs. Neal, sen. (chair), Barnes, Coombe, Crossman, Nelson, Neal, jun., Need, Nadebaum, O'Grady, Ward, Smith (Hon. Sec.), and two visitors.

Feeding off Wheat Crops.—Considerable discussion on this subject took place. Messrs. Barnes and O'Grady favoured the practice of feeding down the crops when the wheat gets an early start. Other members, however, thought the practice undesirable under average conditions.

Tree Planting.—The Hon. Secretary thought that almond trees would bear well in this locality, but Mr. Barnes stated that he had a tree which flowered freely, but did not set any fruit. Members were agreed that in the dry areas almonds were most likely to succeed, and intended to try some next year as an experiment.

Eudunda, September 7.

Present—Messrs. Stange (chair), Schiller, Kluske, E. T. and J. A. Pfitzner, Walter, Marshall (Hon. Sec.), and one visitor.

Experimental Plot.—The Hon. Secretary reported receipt from the Department of Agriculture and the Botanic Garden of plants and seeds of saltbush, which had been set out in the special experimental plot. Mr. J. A. Pfitzner was accorded a vote of thanks for ploughing and harrowing the land free of charge. The other plot was ready for planting summer fodders.

Millicent, September 8.

Present—Messrs. McRostie (chair), Holzgrefe, Stewart, Oberlander, Campbell, and Davidson (Hon. Sec.)

Seaweed as Manure.—Mr. Campbell stated that Mr. W. Clark, of Allandale East, reported very favourably of seaweed as a manure. On poor soil dressed with seaweed he had grown rye and vetches very successfully. Samples of rye 5 ft. in height and of vetches over 3 ft. high from this land were tabled.

Branch Work.—Mr. Campbell read a paper on "The lethargy of this branch," but discussion was postponed.

Dehorning Cattle.—Mr. Harris forwarded article on this subject from a New Zealand paper. The writer, while admitting the necessity for dehorning cattle, contended that it was a mistake to suppress the horns by applying caustic potash to the "buttons" on the young calf. In some cases the horns treated in this way had grown inwardly, and had resulted in injury to the animals. A more serious objection lay in the fact that when the horn is prevented from growing the animal develops the bunting propensity so characteristic of the Aberdeen Angus cattle, and which was as bad in its results as hooking with the horns. When, however, a cow is deprived of her horns after she has learnt their use as weapons of offence and defence she becomes quite tame. Mr. Stewart stated that he had used caustic soda for suppression of the horns for a long time, and had no trouble in regard to bunting. The treatment was very simple and effective, a stick about the size of a lead pencil was dipped in water, and then in the caustic, and the buttons rubbed repeatedly until blood begins to show After this treatment no sign of horns will appear. It was stated that recently in a truck of cattle sent from this district two were killed by another beast goring them.

Cattle Eating Bones.—Several members stated that since they had been applying superphosphate to their lands their cattle had given up the habit of chewing bones.

Illustrations of Weeds - This branch supports the suggestion of the Council of Agriculture that coloured illustration of injurious weeds should be issued, and would recommend that the various States should combine to issue a good set of illustrations

Hawker, September 3.

Present—Messrs Borgas (chair). Bowden, Schuppan, O'Loughlin, Iredell, Hirsch, and Smith (Hon. Sec.)

Management of Horses The Chairman referred to paper on this subject by Mr. Lecky, of Davenport Branch, published in a recent issue of The Journal of Agriculture. He did not consider it wise to work horses with open bridles, nor did he think they could improve the collars, as suggested - rubber collars would not do. Mr. F. O. Hirsch thought Mr. Lecky's suggestion as to the draught would apply to light traffic, but not where heavy pulling was required. A discussion on the use of backbands also took place. Mr. Schuppan considered padded backbands a necessity to enable the horses to work comfortably.

Dowlingville, August 28.

Present—Messrs. Illman (chair). Montgomery, Crowell, Phelps, Mason, Gravestock (Hon. Sec.), and two visitors.

Sheep on Small Farms—Mr. Montgomery initiated a discussion on this subject. He held that it paid to keep sheep even on small farms, as they will eat a lot of feed that would otherwise be wasted, being too short for large stock. They are also very useful in keeping down weeds. Sheep-proof fences were a necessity, and the farm should be so subdivided that the sheep can be changed from one paddock to another fairly often. When other feed is scarce hay can be profitably fed to sheep. A resolution that keeping sheep in this district was profitable was carried.

Quorn, September 5.

Present—Messrs. Thompson (chair), Rowe, Cook, Toll, Brewster, Venning, McColl, Patten, Finlay, Walker, and Noll (Hon. Sec.).

Rugging Cows.—Mr. Cook showed a simple and inexpensive rug made of canvas and lined with bagging The fastening consisted of a light rope running through a ring under the belly, and round the breech, and with a loop round the brisket. He found the rugs very beneficial, and his cows averaged about a pint of milk a day more as a result of the protection against cold. It was resolved that the members endorse the use of rugs from a monetary point of view, as well as a humane practice.

Sheep on the Farm.—The Hon. Secretary read a short paper on this subject. Sheep were specially beneficial in cleaning the land, as they will eat all sorts of herbage much of which other stock will not touch. If any oats spring up on the fallow in summer sheep will clear them off, thus saving a lot of labour. To make a success, however, there must always be plenty of feed and water for the sheep. Besides their value as cleaners, sheep bring in a nice revenue from their annual increase and the sale of their wool, besides providing meat on the farm In reply to question, the Hon. Secretary preferred the merino as the best allround sheep for their district, but if the farmer intended going into the growing of mutton crossbreds were best. For quick returns they should buy store wethers for fattening It was unanimously agreed that it was beneficial to keep a few sheep on the farm. While some members thought horses and cattle would do well in the same paddock with sheep, the majority were of opinion that large stock did not like to feed where sheep had been depasturing

Summer Fallow—Mr. Rowe suggested for trial whether it would not be profitable, instead of fallowing all the land in winter, to graze, say, two-thirds of the land with sheep and cattle until after harvest, when the stock should be sold, the land ploughed up, and then worked down fine as summer fallow. Mr. Venning said his experience was that the winter fallowing was the more profitable.

Arden Vale, August 31.

Present—Messrs Warren (chair), Eckert, Schuttloffel, Miller, Klinberg, Fricker, J and W Williss, and Hannemann (Hon. Sec).

Feeding Off Crops—An interesting discussion on this subject took place. While members were agreed that it was beneficial to feed down the rank patches of crop with sheep, they thought that in their dry country stock should not as a rule, be turned into the crop.

Dog-Proof Fencing.—The hon. secretary stated that he was dog-proof-fencing some of his land, and in some rough parts had some considerable difficulty in regard to fixing the posts, as it was too rocky to dig holes for wooden posts. To overcome this he proposed to adopt the following method: —He would use only iron posts, and would excavate shallow holes, 10 in. to 12 in deep, 12 in wide, and 2 ft 6 in long. He would then take a stout piece of wire, about 6 ft. long, make a loop in the middle, through which the bottom of the post would be inserted and have them placed in the middle of the hole, with the wire lying on the bottom, and projecting at each end. The hole would then be filled up with stones and soil, and the ends of the wires bent upwards, and tightly fastened to the post, about a foot above ground, thus acting as a stay Members thought the plan would work all right, but advised using a longer piece of wire, and securing it 3 ft. or even higher up the post. Mr. H. French, a member of the Pandura Vermin Board supplied particulars of vermin-proof fences. Where dogs have to be combatted the fence must be at least 5 ft. in height, with netting 4 ft. 8 in. high. The combination netting (larger mesh at top than at bottom) was recommended. A barb-wire should be put 4 in. below ground level, and one on the top of the fence. A plain wire was required about 2 ft. from the ground, and another at the top of the netting.

The Education of the Farmer.—Mr. Warren read a paper on this subject.

Brinkworth, September 4.

Present—Messrs. McEwin (chair), Morrison, Cross, Hill, Russell, and Stott (Hon. Sec.).

Licensing Stallions.—Mr. Hill read a paper on this subject. He was strongly opposed to the proposal to impose a licence fee or tax on stallions travelling for hire, as he contended that their farmers were quite competent to judge for themselves what stallions were most suitable for their particular conditions. It was not the owner of the stallion that the tax would fall on, but the farmers, who would have to pay higher fees for the services of stallions One great drawback in connection with first-class stallions was that the owners accepted so many mares and travelled their horses over such a large area of country that the percentage of foals was very small. The fact that over one thousand horses were sold by auction recently at Kapunda for an average price of just under £12 was proof that their horse stock were not deteriorating very much. [As these horses were stationbred, the prices realized hardly bear on the subject of the deterioration or otherwise of our horse stock in the settled districts where travelling stallions are utilized by farmers for breeding horses.—Ed.]

Longwood (Mylor), August 29.

Present—Messrs. W. Nicholls (chair), E. J. and T. G. Oinn, J. Nicholls, Nielson, Hagley, Bradley, Mundy, Cheeseman, Hughes (Hon. Sec.), and 18 visitors.

Spraying Trees.—Mr. E. J. Oinn read a paper on his experience in spraying fruit trees. Paper to be read at Cherry Gardens Conference on October 6.

Dried Fruits.—The Hon. Secretary tabled dried Vicar of Winkfield pear and Northern Spy apples. Neither was quite ripe when cut and dried, but he considered them of superior flavour to any other sorts for home use, though they did not make an attractive looking article.

Grafting Wax.—Members find that less resin is required in making grafting wax than is usually mentioned in The Journal. The quantities used are 1½ lb. fat or tallow, 1 lb. beeswax, and 2 oz. resin. This is boiled, and narrow strips of old art muslin or similar material are dipped into the mixture while it is boiling.

Rhine Villa, September 4.

Present—Messrs. G. A. Payne (chair). Farey, F. F. Payne, Schick. Mickan, Hecker, Pannach, W. T. and J. W. Vigar (Hon. Sec.), and three visitors.

Wool Classing.—Mr. W. T. Vigar read a paper on farm wool classing. First of all, it was necessary to have the shearing shed free from dust and rubbish, to keep the fleeces clean and bright. Make the wool table of laths, with spaces between, so that when the fleece is thrown on the table the second cuts, &c., will fall through. All the greasy, dirty, or "burry" wool should be carefully removed before the fleece is rolled up. Keep all stained pieces by themselves, as if mixed with the other pieces for any length of time they will stain what would otherwise sell as clean wool. All the skirtings should be gone over, and be divided into two classes, even if there are only a couple of bags of each; as, if the greasy pieces under the shoulders, legs, &c., are left with wool that is only "burry" the buyer will only give the prices for the lowest quality. All belly wool should be kept by itself. Be very careful to remove all the pizzle stains from the wether bellies. Carefully bag up all locks and floor sweepings, as even these, if nicely got up, are worth sending to market. Even the small farmer should make two classes of his fleeces. Keep all very yellow or heavy fleeces, and these with a break in them, apart from the lighter bright wool, as even if the buyer in sampling finds only one inferior fleece in the bale, he makes his valuation on that fleece, as he cannot say how many such are in the clip. The farmer may be certain that in any cases of doubt the buyer takes no risks. In all cases brand bales or sacks plainly and neatly, for wool, like other products, will sell to advantage if got up neatly. Finally, give the broker full control of the wool after it reaches him, for the farmer may rest assured that the broker does best for himself when he does best for the owner. Mr. G. A. Payne asked whether it was really worth while to take the bellies off the fleeces with a very small flock. Mr. Farey said he skirted the fleeces when he had a fair-sized flock, but with only a few sheep he found he got just as good prices without going to the trouble of skirting.

Nantawarra, August 28.

Present—Messrs. Dixon (chair), R. and J. Nicholls, Belling, E. J. and A. F. Herbert, Sleep, Pridham, Greenshields, Spencer (Hon. Sec.), and one visitor.

Agricultural Motors—Mr. E. Pridham read a paper on the steam motor for general farm cultivation. From an economical standpoint the cheapest methods of cultivating the soil undoubtedly appear a most important matter to the farmer; but, admitting all that is said in favour of the steam and other motors for farm work, he would like to outline the probable result of the general adoption. First of all, the very profitable industry of horsebreeding would be killed. The farmer can rear his own horses at very small cost by utilizing the waste feed on the farm for rearing young stock. What hay he saved by dispensing with his horses would be balanced by the cost of oil for his motors. They must not overlook the fact that much of the work performed by their horses is done on the waste lands and on fodder which could not be profitably turned to other uses. Besides, the land being spelled, will on large farms keep 12 horses. The feed here would also have to be used for other purposes. Doubtless the farmer would keep more sheep, pigs, dairy cows, and poultry; but what were they going to do with all this produce? The end would be that prices would fall so low, owing to over-production, that they would be unprofitable Food for man would be dearer, as, owing to the limited market for bran and pollard the price of flour would have to be raised. Then the thousands that depended upon the various trades, such as harnessmaking, the manufacture of leather, &c., would be thrown out of employment. He was strongly convinced that the general adoption of the agricultural motors would be a national calamity, and, as such, the Governments of the various States should take such action as would prevent the displacement of horses from the farm Considerable discussion ensued, but Mr. Pridham's extreme views found no supporters. Members pointed out that similar arguments had been put forward when various mechanical contrivances to lessen the cost of labour had been invented. Railways, binders, strippers, and many other implements had met with violent opposition, but still people managed to live. All labour saving machines ultimately proved of benefit to the world, and with the lessened cost of production the cost of living was cheapened. In reply, Mr. Pridham admitted that he did not altogether believe in his own arguments, but had brought them forward to get both sides of the question.

Woolundunga, August 18.

Present—Messrs. Prosser (chair), Moseley, Smoker, Greig, Michael, Walker, Aldenhoven, Rogers (Hon. Sec.), and nine visitors.

The Drought: Its Effects and Remedy.—Mr. Michael read a paper on this subject as applied to their immediate neighbourhood. Ten years ago the 60,000 acres comprised in the district consisted of fair grazing land, producing barley grass, speargrass, clover, and other herbage, including thousands of acres of splendid perennial saltbush. This land would carry 20,000 sheep in an average season, but from 1894 onwards the carrying capacity of the land has decreased to a remarkable extent owing to the light rainfall. The grasses and herbage have almost entirely disappeared, the perennial saltbush exists only in a few patches, and the land is bare and desolate. From 20,000 to 25,000 acres is almost entirely destitute of vegetation, and duststorms, even in winter, are of daily occurrence. Of the remainder of the district about

8,000 acres are under wheat. Can they do anything to assist nature in restoring the land to its former condition? One thing was certain, that unless they stopped the drift, for every acre now affected there would most probably be two next year. He would suggest that the hard bare land should be ploughed up as soon as possible; this land when ploughed will catch and retain any sand drifting across it during the summer. The loose land should be worked with scarifier or cultivator about February, and seeding commenced during the first week of April. He would sow mainly wheat, and only the early varieties. On light land barley might do well in a fair season. In seeding only harrow sufficiently to cover the seed; the rougher the land is left when there is a tendency to drift the better. Although this drift was becoming so extensive and far-reaching, he believed that with a return of fair seasons, and each landowner co-operating to break up the worst parts of the bare land, there would be a return to something like the conditions of former years, provided, however, that the land is only lightly stocked for several years.

Morchard, August 8.

Present—Messrs. Scriven (chair), Longbottom, Forbes, Kirkland, Kitto, O'Loughlin, Piggott, McDougall Kupke, Toop, Graham, McKenzie, Kummnick (Hon. Sec.), and about 30 visitors

Homestead Meeting.—This meeting was held at Mr. W. Toop's homestead. After the garden, outbuildings, and other items of interest round the homestead had been inspected ordinary Bureau business was transacted, on the conclusion of which members and friends were entertained by Mr. and Mrs. Toop.

Weeds.—Mr. Kirkland tabled specimen of iceplant which has encroached on the wheat crops to such an extent this season; also some poisonous plants and a weed new to the district.

Saving Straw.—Mr. Kupke read a short paper on the necessity for stacking all available straw for use during times of drought. Members were unanimous in agreement with the paper, and consider the binder should be used for gathering the straw. In stacking the straw add molasses to improve it; horses will be found to relish it, and although it may scour them for a few days it will do no harm. Mr. Kupke favoured the use of the header, as the absence of grain in the straw would tend to keep out the mice.

Farm Horticulture.—The Hon. Secretary read a paper on this subject. He advocated the setting apart of a few acres of land for irrigation purposes and the growing of green feed, vegetables, and fruit trees wherever it was possible to do so. Most of the members agreed.

Sale of Adulterated Chaff.—Members favour legislation to prevent the sale of inferior or adulterated chaff as hay chaff.

Selling Manures by Weight.—It was resolved that members of this branch co-operate with other farmers in refusing to accept ten bags of manure as a ton, and demanding full weight in all cases.

Cradock, September 5.

Present—Messrs. Patterson (chair), Graham, Fitzgerald, Turner, Garnet, Iredell, Lindo (Hon. Sec.), and two visitors.

Poison Weeds.—The Hon. Secretary read report by Mr. Morris, M.R.C.V.S., on poisoning of cattle by "Cape Tulip," and some discussion took place in reference to losses of cattle and horses at various parts, which indicated the presence of poisonous plants. Mr. Fitzgerald thought it very unsatisfactory that publicity had not been given to the results of Mr. Desmond's enquiry into the Hawker horse complaint. If this investigation had elicited anything definite concerning the cause or remedy for the trouble the public were surely entitled to know about it. Mr. Garnet said that the most frequent ailments of horses were colic and stoppage of water; for the former he found homoeopathic nux vomica and for the latter belladonna good remedies.

Gladstone, September 5.

Present—Messrs. Sargent (chair), Rundle, Gallasch, Burton, Cook, Smith, Greig, Smallacombe, and Wornum (Hon. Sec.).

Cultivation of the Soil.—Mr. Sargent read a paper on this subject from a wheatgrowing point of view. It was almost universally admitted that the best yields were obtained from early fallow. Fallowing was quite as important an operation as any other farm work, and should therefore be done at the proper time and in a thorough manner. Ploughing should only be done when the ground is mellow, and on no account when either very dry or boggy. He would advocate starting directly seeding operations are finished, say about the first of June. On limestone and black land it was sufficient in their district to plough three inches in depth, but on red soil he would go up to six inches. Fallow land should generally be well harrowed, but only after rain· a fine tilth should be secured. He would not use the scarifier except to kill the weeds, and then only when the surface is dry, as working the soil too much when dry has a disastrous effect on the crop. No preparation of the land for seeding should be undertaken during the summer, as it will only result in loss of moisture as well as valuable properties from the soil. Seeding should not be undertaken until after a fall of rain, and under ordinary circumstances should be completed between the 1st of April and the end of May. He would use a light scarifier or cultivator ahead of the drill, and would put in the seed as shallow as possible One stroke of the harrows should be given behind the drill. As an instance of the value of shallow cultivation ahead of the drill, he stated that he and a neighbour were seeding fallow land this year at the same time, both using the same kind and quantities of seed and manure; but while he worked the fallow deeply with the scarifier his neighbour only used the scarifier harrows lightly. The neighbour's crop to-day gave every promise of a much heavier yield, having come up thicker and better than his own. He believed that deep tillage under dry conditions had a tendency to cause the seed to malt. Mr. Rundle did not agree with the conclusion arrived at by Mr. Sargent, he would work deeply ahead of the drill to destroy the weeds. Mr. Burton and the Hon. Secretary advocated deeper ploughing; the latter would not work deeper than 2½ inches before sowing, as if they did they would destroy the seed bed, which should be fine and firm.

Clare, September 4.

Present—Messrs. W. S. Birks (chair), Kelly, A. P. Birks, and Greenway (Hon. Sec.)

Manuring of Vineyards—At previous meeting Mr. Greenway read a lengthy paper on this subject. Under natural conditions the greater the growth of vegetation on any soil the richer that soil ultimately becomes, since all of it returns to the soil in the form of decomposed vegetable matter, the finest manure of all for land under intense cultivation. Man when he cultivates the land works directly contrary to Nature in this connection, since he takes away from his land all that he grows thereon, and instead therefore of enriching the land by his system of cultivation is merely drawing on the supplies of plant food that Nature has been slowly storing in the soil during countless ages. When they came to consider the quantity of plant food which they removed year after year they could easily understand that the land was steadily and continuously being depleted of its original stores. They must also appreciate the fact that they could not continue to crop the lands successfully unless they replaced what they were removing from them. Many methods, varying according to local circumstances, had been tried by farmers to preserve their lands from deterioration, but vineyard owners were necessarily debarred from the help given by change of crop or resting the land, and it therefore was necessary for them to give this question of manuring very careful attention. It was of course a well-known fact that as a general principle quantity and quality did not run in double harness, but so far as concerned the production of grapes for winemaking this was a question that need not worry them, as the winemaker pays the same price for all grapes of one variety, irrespective of the sugar content or the suitability for making high-class wine of the different growers' crops. He hoped however, that in years to come this would be altered, and that manufacturers would discriminate between the different qualities of the same variety, and make their wines accordingly. At present, however, except with currants, sultanas, and raisin grapes, which will depend for their weight in cured fruit on the sugar content, what they had to aim at was the highest possible total yield per acre. The only portions of the product of the vine removed from the land are the fruit and the prunings. The latter if burnt return a portion of the plant food in the ashes, but the nitrogen is lost. Theoretically to replace what is taken away in 4 tons of grapes and half a ton of cuttings they would require 96 ℔. nitrate of soda, 80 ℔. sulphate of potash, and 76 ℔. of ordinary super. As it is impossible to apply the manure in such manner as will ensure that the whole of it shall be utilized it would be necessary to apply much more than the above quantities; double would not be too much. They must, however, consider the action of the different fertilisers. Roughly speaking, an excess in the supply of nitrogen produces wood and leaf growth, while potash goes to the fruit. It was only by careful watching of his vines and by experiment that the vinegrower can determine what manures should be applied to his land. No hard and fast rule can be laid down as to the proportions of nitrogen, phosphoric acid, and potash that should be applied, but as a general rule, and especially where cereals have been grown previously, the land will benefit from the application of phosphoric acid. He also thought that a large area of vineyard land was deficient in nitrogen Fortunately phosphoric acid can be cheaply purchased in the form of superphosphate. Nitrogen is more expensive, but by growing leguminous crops, which obtain nitrogen from the atmosphere, and ploughing them under, the stores of this ingredient will be replenished, and in addition the mechanical condition of the soil greatly improved. Potash must be supplied, and to lessen the outlay it was advisable to burn all the prunings and return the ashes to the land.

Honorary Members – It was decided to ask permission of the Department of Agriculture to appoint honorary members, as there were members unable, owing to distance from meeting, to attend regularly, but who did not wish to sever their connection with the Bureau. [There is nothing whatever to prevent branches appointing gentlemen as honorary members; such members would not be entitled to appointments as officers of the branch, or to receive The Journal of Agriculture free. Ed.]

Bute, September 1.

Present -Messrs. Trengove (chair), Gitsham, Barnes, Sharman, A. and H. Schroeter, Hamdorf, Haldane, Commons, Masters (Hon. Sec.), and three visitors.

The Pig on the Farm.- The Hon Secretary read a paper on this subject. He admitted that under the conditions under which many people kept their animals pigs did not pay, but on proper lines there was money in pig-breeding. Those who fail will quickly point out all the bad points of a pig, and the road to success lies in minimising these, and taking full advantage of the good points they possess. Great care must be exercised in starting the herd, as some pigs require double the food necessary to keep others in good condition. Get the short-nosed, chubby, contented sows of ordinary breeding, and with care in mating with Berkshire or Essex boars they would have pigs easily kept and quickly fattened. Ten or 12 years ago the late Mr. T. N. Grierson strongly advocated utilizing the pig as a grazing animal. Before he left South Australia Professor Lowrie was equally emphatic on this point. His own experience, after several years' test, had proved the correctness of Mr. Grierson's contentions. From May until January green feed must be provided in paddocks of one or two acres in area. These paddocks should be sown at intervals, starting with the first rains after February, and continuing to sow up to June. Barley seems most suitable for these plots, as he had seen it eaten close down before wheat and oats growing in the same paddock has been touched. Some of the barley should be allowed to ripen, and be used for feeding from the end of November to beginning of January. The pigs must be shifted from paddock to paddock as the crops come on. It may be necessary to give extra feed for a week or two before all the grain, chaff, &c., is carted in from the fields; but when this is done the pigs may be turned on to the stubble paddocks, where they will thrive on the waste grain, &c., until the end of March. Sorghum and piemelons should be grown for feeding during the late summer and early winter months. The topping up for market must be done in styes with wheat, and, under ordinary circumstances, the pigs will be ready in two weeks. Where there is a lot of grain left in the fields even less time is required. This system is not only the most profitable, but it removes that bugbear of labour and cost of feeding. It was a mistake to keep the pigs after they are 12 months old; as a rule it pays best to dispose of them at nine months if fit. The farmer rearing 30 to 40 pigs yearly should get from £60 to £80 for them, and as three sows and a boar are all the breeding stock required there was no other animal that would give so large a return on so small an outlay. The cost of manuring, seeding, and cultivating the 20 acres required for the maintenance of the pigs, and the grain for final topping up when compared with the cost under the old system, shows that the above method is the better. He had found that the addition of three or four barbed wires under the bottom wire of an ordinary three-wire fence answered capitally for the enclosures. One paddock netted with ordinary netting had been in use for ten years, and appears as good as ever, and at the present time he was enclosing paddocks for pigs with ordinary wire netting. To prevent rooting he would ring the pigs when about three months old. The sows will of course require a little extra care and attention when farrowing, and must be well fed until the young ones can look after themselves. Mr. Barnes agreed that the breeding of pigs on the lines laid down by the Hon. Secretary was a profitable adjunct to wheat-growing. He had seen pigs purchased and fattened on barley grown specially for the purpose. When the barley was just ripe the pigs were turned into the field to harvest the grain themselves. Generally there was a weakly pig in each litter and his experience was that it did not pay to raise such. Mr. Sharman also agreed that rearing pigs under these conditions was profitable, but he preferred the Poland China-Berkshire cross, as they matured early The Hon. Secretary said it was more profitable to sell the live pigs in the Adelaide market than to kill them and sell the carcase; the latter involved a lot of trouble and some risk of loss.

Saddleworth, September 18.

Present Messrs. Frost (chair), Bee, Benger, Neill, Klau, and Scales.

Congress and Show.—Messrs Frost and Benger reported on proceedings of the annual congress, and other members reported on various phases of the Royal Show, general surprise being manifested at the magnitude of the show.

Narridy, September 9.

Present—Messrs. Smallacombe (chair), W. R. and E. Smart, Kelly, Turner, Freebairn, and Dunsford (Hon. Sec.).

Poultry.—Mr. Freebairn reported at length on proceedings of annual congress, and Mr. Turner read Mr. von Bertouch's paper on poultry. Mr. Turner thought the writer should have been more precise in his figures, as there was no record in his balance sheet of the cost of certain articles of food, &c., which he stated he provided for his fowls. Mr. Turner disagreed with the advice to use Douglas mixture; he had bad results from it, and quoted American reports confirming his opinion. The question of inbreeding to establish strains was referred to, but members were opposed to inbreeding of stock of all kinds. The statement of Mr. D. F. Laurie that a number of flocks in America had records of 200 eggs per hen, was questioned, and it was stated in this connection that the Editor of Farm Poultry, Boston, had thrown out a challenge to any one to prove that such flocks existed, but it had not been taken up.

Minlaton, August 29.

Present—Messrs. Anderson (chair), J. and H. Martin, Vanstone, Roundy, Twartz, Newbold, A. and J. McKenzie (Hon. Sec.), and one visitor.

Field Trial.—On August 12 a field trial of the Excelsior drill was held near Minlaton, under the auspices of the Bureau, in the presence of a large number of farmers. In order to test the drill thoroughly Algerian oats were sown on a hard surface to demonstrate the regularity with which both seed and manure could be distributed. Over 60 acres were put in this season by the drill, which is the invention of Mr. W. Correll, of Houlton, who claims for it that it will distribute the seed without breaking it or even bunt balls. The distributors are the same for both grain and manure, and run in oiled bearings. The feed is so arranged that in the event of any hard foreign matter getting into the seed or manure box it will rise and let it pass through. Various other improvements are combined in this drill, which, on the whole, was very favourably commented on by those who witnessed the trial.

Protection of Native Birds.—After considerable discussion, it was unanimously resolved that this branch views with alarm the widespread destruction of our native birds by the distribution of unsuitable poisons for rabbits, and by the use of smallbore rifles. Members thought the use of these guns should be regulated by law.

Complete Harvesters. The Hon. Secretary read a paper on this subject. He noticed at some Bureau meetings the harvester had been described as one of the wasters on the farm, but this was far from his experience of its use. After two years' trial he said without hesitation that the harvester was one of the most up-to-date labour-saving machines ever placed at the disposal of the farmer. He had proved that he could get more grain per acre with the harvester than with the stripper, besides which they can get over quite as large an area in the same time, and have the wheat and chaff in bags instead of in heaps in the field, as with the stripper. The harvester can be worked in any weather so long as it is not actually wet. With an extra man and two horses the bags can be sown up and carted to the barn each day as harvested, so that in the event of rain the farmer has the satisfaction of knowing his grain is under cover. During last harvest heavy rains fell, and the wheat in heaps in the field was nearly washed away and having to be left for some time before it was winnowed the grain all around the heaps sprouted, and there was considerable loss both in grain and chaff. The portion gathered with the harvester, however, was all bagged and safe under cover. He preferred the harvesters with the backward blast winnowers for saving the chaff, as it was easier to dispose of, and if the carrier is properly arranged it will balance the machine better; it also shelters the winnower from rough winds, and enables it to do better work. On small, cleared farms, however, he would not use either the stripper or harvester, as the binder and header would prove more profitable. In regard to wear and tear, he did not consider the harvester so complicated as the binder, or even the seed and fertiliser drill, and with reasonable care he believed it would last in good order nearly as long as a stripper.

Hartley, September 4.

Present—Messrs. Jaensch (chair), Klenke, Kutzer, Reimers, Stein, Wundersitz, and Fry (Hon. Sec.).

Sore Shoulders.—Discussion took place on prevention of sore shoulders on working horses. Members thought that if the collar fitted properly and tightly, and care was taken to prevent the mane getting under the collar, the horse would not be liable to sore shoulders. Members advocated clipping on the shoulders, as it would then be easier to keep them clean and free from sweat. Horses turned out for any length of time should not be worked hard for the first few days after starting again; and fast driving directly after the horse had eaten, or had a drink, should be avoided.

Standard Weight for Chaff.—Members favoured proposal to have a standard legal weight for a bag of chaff.

Holder, September 6.

Present—Messrs. Rowe (chair), Vaughan, Perry, Jones, Pickering, Jaeschke, Green (Hon. Sec.), and one visitor.

Irrigation.—Discussion took place on question of irrigating trees and vines when in full bloom. Members had found from experience that an excessive flow of sap at that stage caused a poor setting of fruit.

Tatiara, September 5.

Present- Messrs. Fisher (chair), Rankine, Bond, Killmier, Wiese, Smith, and Hughes (Hon. Sec.).

Hon. Secretary.—Mr. J. Bond was appointed hon. secretary in place of Mr. H. E. Hughes, who resigned his position owing to living too far from the post office to attend properly to his duties.

Horsebreeding.—Mr. H. Killmier read a paper on the treatment of the "in foal" mare. He thought every farmer should have at least one mare in foal every season. Many people held that the mare could not be worked when in foal, but his experience was that properly managed he could get more work out of the mare than out of the gelding. Too many farmers have not sufficient thought for their dumb animals to exercise reasonable care, and give them the attention they require. It is not so much the work she does as the way she is treated that will injure the "in foal" mare. Sometimes after the mare has been running in the paddock for months she will be brought in and put into the team to do a day's work with binder or stripper. Naturally she will perspire freely, and at dinner time when in a great sweat she is taken out of the team and tied in a stable or under a tree to feed, and is exposed to draughts. When the team starts again the blood is chilled, and the mare will get overheated. Under such conditions it is no wonder if she suffers from inflammation or other complaints, or slips her foal. He found it best to work the mares steadily until they harden to their work, when they will work hard all day without any injurious effect. He had worked his mares up to within about a week of foaling, but as they get near their time the greatest of care must be taken that they were not subjected to sudden strains and jerks. The feeding of the mare is also an important item. He made it a practice to feed the breeding mares first, and gave them a little bran and crushed oats occasionally in addition to chaff. The little extra expense is well repaid, as it keeps the mare in good health, and the foal will also benefit from the attention the mother receives. Some farmers will say good chaff is sufficient, but he was sure it would pay to sell some chaff and buy bran and oats, as a change of food occasionally is beneficial to all stock. Mr. Rankine called attention to the Bill before Parliament dealing with the licensing of stallions, and thought the branch should support the mover. He also thought that the Railway Department should give better facilities for rail carriage of stallions.

Scales Bay, September 5.

Present—Messrs. Roberts (chair), A. and G. H. Newbold, Plush, Thomas (Hon. Sec.), and one visitor.

Manures.—Several members reported on experiments during past two years with manures, and the general opinion was that in the Calca district 56 lb. per acre of super was sufficient; that the manure should not be used too early in the season, and that the manure gave the best results when put in shallow. At Oakville, Messrs. Roberts & Sons have plots sown with different qualities of manure, from 20 lb. per acre up to 100 lb. per acre, and the difference between the growth on the plots was very marked; the heavier the dressing the better the crop. This land, however, is much firmer and heavier than around Calca. Mr. Plush wished to know how to treat gypsum before applying it to the land. Should it be burned before using? . [It is sometimes burnt, but this is not really necessary, as while burning increases its action it also adds considerably to the cost.—Ed.] The Chairman asked whether land ploughed dry and sown early with manure would be likely to give a good crop. Members' experience was that irrespective of the question of manure such crops were generally failures. They were, however, uncertain whether the fact of the manure being in contact with the seed would have an injurious effect. [South Australian experience indicates that little or no injury results from the grain in dry soil remaining in contact with phosphates.—Ed.]

Takeall.—This trouble has made its appearance on the lands that have borne six or seven crops. It affects both early and late fallowed land, and this year is as bad on manured land as elsewhere. Loose as well as heavy land is affected, and all varieties of wheat appear to suffer alike. New land is free from the trouble, and oats or barley will do well on land on which the wheat fails. Black rust has appeared on one or two farms in the eastern part of the district, on the heaviest lands.

Season.—The weather of late has been all that could be desired for the crops. Tailing of lambs has been completed, and the average for the district is about 80 per cent. of lambs. Shearing has commenced, and the clip is good.

Wandearah, August 31.

Present—Messrs. Robertson (chair), W. and R. Roberts, Munday, Dick, Fuller, Stanley, Birks, E. H. and E. J. Eagle (Hon. Sec.).

Dairying.—Mr. Dick read a paper on "Treatment of the milk cow." Care should be taken to dry off the cow properly; if this is not done blind teats and a bad udder may be the result. He would dry off the cow eight or ten weeks before she comes in again. When the cow calves give a warm bran mash, into which a handful of salt has been stirred. Take care that the mash is not too wet. About 12 hours later give 12 to 16 oz. Epsom salts and a tablespoonful of ground ginger in a drench. If this practice is followed there will be no trouble about the cow not cleaning properly. He would allow the calf to suck the cow during the first 10 or 12 hours, and in the case of heifers he would allow the calf to remain even longer, as she will be more easily quietened and milked. Care must be taken to see that the calf sucks each teat. Where cows are stall fed, do not overfeed, but let them come into milk gradually The Chairman always took the calf away as early as possible, but most of the members agreed with Mr. Dick that it made the cows much easier to milk if the calf was allowed to suck for a time. Mr. E. H. Eagle held also that the calf gave less trouble, and took to sucking and feeding more readily if left with the cow for a few hours.

Mundoora, September 3.

Present—Messrs. Aitchison (chair), Blake, Mildren, Mitchell, Beck, and Gardiner (Hon. Sec.).

Treeplanting.—Members are desirous of having a portion of the main street of the township planted with trees, and after considerable discussion it was decided to ask the local council to assist them by protecting from damage any trees which the members and residents planted in the streets.

Morchard, September 4.

Present—Messrs. Longbotham (chair), Toop, Piggott, Kitto, Kirkland, Kupke, and Kummnick (Hon. Sec.).

Business.—Various matters were dealt with. Mr. Kitto referred to reports of the American combination of farmers to fix a minimum price for wheat. It was resolved that Mr. Kitto interview the Water Conservation Department to ascertain whether the Government could arrange for cheap schemes for boring for water where farmers combine to meet the cost.

Redhill, September 3.

Present—Messrs. Stone (chair), Button, Steele, Nicholls, Wheaton, Torr, Ladyman, Robertson, D. and J. N. Lithgow (Hon. Sec.), and one visitor.

Conservation of Fodder.—Mr. J. N. Lithgow read a paper on this subject. To secure the best results from their stock it was necessary to have a sufficient supply of good fodder. They must be careful not to overstock their land in good seasons, and also to conserve all the surplus feed for seasons of scarcity. Although it was not possible to always make sufficient provision for all requirements of stock during such a succession of poor years as they had passed through, a little labour and expense would have greatly reduced their losses. In good seasons a fair amount of the crop should be cut for hay, and he would advise mixing 2 bushels Cape oats with 1 bushel of wheat and sowing at the rate of 1½ bushels per acre. Any crop of good growth not likely to give a good proportionate yield of grain should be made into hay. Some of the crop should also be harvested with binder and threshed, and the straw stacked. A portion of the stubble should also be cut with the binder. This straw, if well stacked and thatched, will keep in good order for several years; in fact, it seemed to improve with age; at any rate stock would eat old, well-kept straw in preference to new. To provide sufficient fodder for their stock did not entirely depend upon the quantity that was stored. A great deal depends upon its judicious use. It often happens that economy in feeding is only commenced when the stackyard begins to look empty, instead of being economical at all times. He thought that by chaffing the straw and hay and mixing them they could make the best use of the inferior food and keep their stock in good condition. It is a great mistake to use the good hay first and leave the self-sown hay, the straw, and the cocky chaff until last. Care should be taken not to feed hay to the stock when there is good paddock feed. It would be far better in the end to utilize the hay, straw, and cocky chaff with such grain as was available to make a good average food, than to feed the best while it lasted and then only have inferior stuff left Members wished to know why header straw caused scouring in horses; ordinary stubble had no such effect.

Amyton, September 3.

Present Messrs Thomas (chair), Mills, Kelly, Hughes, Gray, Wheadon, W. T. and Walter Gum, Mullett (Hon. Sec.), and one visitor.

Disposal of Farm Products.—Mr. J. Gray read a paper on this subject. In discussing this matter it must be with normal conditions in view; there was no difficulty in selling profitably when prices are high. They must, of course, bear in mind that the work of distribution could not be done without cost, and that the middleman was practically a necessity, although too often he took the greatest share of the profits from the farmers' labours. Naturally he does not cut his profits down to the lowest limits, and as most of their products were handled by a few firms combination was comparatively simple The only way for the farmers to be sure they were not being charged too much was for them to have a distributing medium of their own. This they had at present in the Farmers' Union, and every farmer should become a member of this, and regard it as his own firm, the welfare of which should be his special care. All the business possible should be done through the Union which could handle every line of farm and dairy produce. He did not expect any organization would ever do all this trade, but its existence, if properly supported, would prevent any combination against them, and would ensure the agency work being done cheaper. In connection with the disposal of their produce there were several aspects worthy of consideration. First they must export a large proportion to distant markets, and this trade was always attended with risk. Even in the matter of sending stock from the country to Adelaide they had illustrations of the fact that owing to the prices varying, according to whether the supply was equal or greater than immediate requirements, it was not always the best policy for the farmer to send direct to the market. Where a man can send only a single truck of stock in the season he may happen to hit a low market and loses, whereas the dealer who buys throughout the year has the opportunity of recouping any such loss on his other deals. At stations where trucking facilities exist the prices of the leading markets are fairly reflected, and it is an open question whether it is not the wisest plan for the man with only a few stock to take them to the nearest market, as if the price does not suit him he can hold them over. Of course, the dealer must make a profit on the stock he handles, but this is only fair compensation for the risks he runs. The same thing applies in even stronger degree to the export to outside markets; the merchant occupies to a large extent the same position that the dealer holds in regard to the local trade. Having experience and being continually in the business the merchant is better able to make the best of the export trade; if one shipment results in loss, he has other opportunities of recouping himself. The report and balance sheet of the Farmers' Union recently published shows that heavy losses have been sustained owing to the Union buying wheat for export, as any speculator would, instead of acting merely as an agent. With a large capital to work on the Union might take up the business with more confidence, but he thought at present, at any rate, it would be safer to sell in the local market and not take the risk involved in exporting. Another aspect of the question of disposing of their produce might also be mentioned; that was to hold over such products as hay and wheat when they were plentiful and cheap: or, if this could not be done, to convert them into pork, mutton, wool, or eggs, by feeding them to stock, if such course would prove more profitable. Considerable discussion followed, and it was agreed generally that a co-operative association working with substantial capital and under expert management would most nearly effect the desire of the farmer to secure the best price for his produce. Members considered that even under present conditions the Farmers' Union was a bar to any attempt to form rings or combinations detrimental to the farmer. Mr. W. Gum expressed the opinion that as a result of the existence of the Union farmers had received 1d. per bushel more for their wheat than they would otherwise have done.

Virginia, September 7.

Present—Messrs. Hatcher (chair), Taylor, Pavy, Huxtable, Sheedy, Nash, Strempel, Sheedy, White, Thompson, Odgers, Ryan (Hon. Sec.), and three visitors.

Fallowing.—Mr. Taylor read a paper on this subject. He thought July quite early enough to start fallowing, but when they got an early season fallowing might well be commenced in June. Where the soil is shallow he would plough 4 or 5 in. deep; but in sandy land, which had a tendency to drift, he liked to go 7 in., and also to bring up some of the clay. The drifting of the sandy land was a very serious question, as their best hay crops were produced there, and the man who can instruct them how to fallow the sandy land without causing it to drift would be as great a benefactor as the proverbial individual who was to make two blades of grass grow where but one grew before. He found the drift was at any rate checked by bringing up a little clay, which at first cakes, and then when cultivated will leave the surface of the fallows somewhat lumpy. He always liked to bring up some fresh soil to the surface; in fact, he believed strongly in deep cultivation where possible. They saw for a long while on land that had formerly been used as a garden the benefits of deep cultivation. After ploughing he would not interfere with the sandy land more than necessary to keep it free from stinkwort or other weeds. Other land he would leave for six or eight weeks to allow the sun and air to penetrate freely. Then he would harrow lightly to break the furrows before using the scarifier or cultivator. He did not believe in rolling the land under ordinary conditions, and had failed to get good results from summer fallowing. The latter practice, however, was often necessary, as feed was wanted for sheep, but care must be taken to plough after rain and to cultivate thoroughly before seeding. Generally, however, he considered it a mistake to turn up the soil in the hot season, though, like most farmers, he found it sometimes impossible to do things when and how he would like to. Members generally believed in deep fallowing where the soil permits.

Mount Compass, September 23.

Present—Messrs. Jacobs (chair), De Caux, Gowling, Good, Hutton, Jenken, Klauss, Peters, Slater, and McKinlay (Hon. Sec.).

Rabbits.—Mr. De Caux gave an interesting account of a recent visit to the rabbit preserving factories in the south-east. He strongly advocated the establishment of a centrally situated factory in the south. Not only would this be of benefit to land owners and rabbit trappers, but the owners of orchards, who usually had a considerable quantity of fruit unfit for export, but very suitable for drying, canning, or otherwise preserving. Not only were there rabbits and fruit, but very large quantities of first quality vegetables were raised in this locality, and a well appointed factory could be kept going all through the year. The district offered many advantages to a factory in possessing a cool climate, abundance of wood, and water, and cheap sites. All the members agreed with Mr. De Caux's views, and a lengthy discussion took place.

Mount Pleasant, September 18.

Present—Messrs. Phillis (chair), Tapscott, Royal, Thomson, and Vigar (Hon. Sec.).

Dairying.—Mr Thomson commented on the address given by the Dairy Instructor at the congress on private separators and dairy cattle. [Did Mr. G. S. Thomson's views on these two important subjects meet with approval or the reverse? On such a discussion surely members expressed some definite opinion.—Ed.]

Golden Grove, September 3.

Present- Messrs. Milne (chair), Harper, Maughan, Ross, Woodhead, Angove, Buder, Rawlings, Hannes, N. J. and A. D. N. Robertson (Hon. Sec.).

Improvement of Horse Stock. Mr. Woodhead read a paper on this subject. He attributed the deterioration of our horse stock to several reasons, including the low prices of some years back, the want of pure blood sires, and also to a very great extent to the want of blood in their mares. Nine out of ten old hands will tell them that the draught stock of to-day lacked the grit and stamina of those of the early days, and he put this down to the lack of blood strains in their mares. In the early days they bred from nice spring-cart and similar classes of mares, mostly got by blood horses. He did not know exactly how they were bred, but he thought there was a good strain of the Timor in them. At any rate, mated to clean-legged, upstanding horses of good shape and constitution they produced many useful, active, medium draught horses with clean legs, plenty of grit, and able to stand any amount of work. They then had no Clydesdale or Tasmanian mares, which were imported at a later date, and which for a time were a great success; until, in fact, what might be termed the native mare became practically extinct. In his opinion the best way to improve their horse stock was to mate their best spring-cart mares of good breeding to a thoroughbred draught stallion. This should throw a suitable class of mares to again put to a draught horse. He also thought that a good Timor stallion mated to their nice, square little mares, and then the progeny bred to draught stock, would give them serviceable horses that would stand a lot of knocking about. In breeding from their present stock farmers should exercise considerable judgment in mating, and above all see that the stallion is pure bred, sound, and free from constitutional defects. He should have good feet and plenty of bone, with bold countenance, good neck, well-sprung ribs, fairly wide across the hips, and with a bit of life and go in him. Mr. Ross disagreed with the paper. It was best to breed from draught stock and not to cross with the lighter mares. Members considered farmers must study their own special requirements in breeding. It was, however, very difficult to combine strength, activity, and endurance, which were necessary in a first-class farm horse.

Woodside, September 18.

Present—Messrs. Caldwell (chair), Fowler, Rollbusch, Keddie, Heidrich, Johnson, Kleinschmidt, and Hughes (Hon. Sec.).

Lucerne.—Mr. Johnston read from The Australasian an article on lucerne growing, which created considerable discussion.

Wilmington, September 2.

Present—Messrs. Slee (chair), Hannagan, Maslin, Bischof, Robertson, McLeod, Sullivan, Payne (Hon. Sec.), and five visitors.

Feeding Farm Stock.—Mr. Maslin initiated a discussion on this subject. He thought the foal should run with the mare until six months old, and then be turned into a paddock containing good natural grass; if the grass is not plentiful give some good Cape oat hay, or chaff. When broken in, he liked to feed the horse on oaten hay, long or chaffed. Failing oaten hay, he would give wheaten hay with some grain in it. For sheep, natural pastures not too rank, or lucerne paddocks were most suitable. For cattle, they could not do better than run them on lucerne paddocks, failing this, good natural grass, but not too much clover was necessary. For dairy cows hay in winter time, and a good grass paddock to graze in, was required. A good discussion followed; members were of opinion that where possible the foal should be left with the mare until at least six months old. Most of the members agreed that feeding down the grass with sheep kept it green longer, and improved its qualities. If grazed on lucerne, they should not be allowed more than three or four days at a time in each paddock, as the continued nibbling will destroy the lucerne. Members would add ensilage to the cows' food

Horse Breeding.—Mr. W. Robertson read a lengthy paper on this subject. He had been intimately connected for very many years with the breeding of horses on a large scale on pastoral areas, and also on high-class agricultural land. He was glad to notice that the industry had emerged from the depression which had overshadowed it for so long, and with the assured continuous demand from India and Africa, he was confident it was only necessary for them to breed the right stamp of horse to secure remunerative prices. He felt that there was good ground for the statement that our horsestock had deteriorated of recent years, especially in the roadster and hackney classes. This was to be attributed to several causes. First the demand at one time was so great and prices so high, that numbers more than quality became the aim of the breeder; all sorts of mares were bred from, and less discrimination exercised in the choice of sires. Then again in the early days the breeding stock were imported, and also had the benefit of new and lightly stocked country. A point he particularly wished to emphasize was that young horses, to develop to perfection, must have either new pasture or be grazed on land cultivated and manured with phosphates. Land unquestionably becomes "horse sick," and, however good the grasses may appear, the young stock do not thrive. This was the secret of the decadence of so many thoroughbred studs which fail to produce horses of note after a few years. Then again, on the larger stations the presence of wild mobs of horses was a large factor in the degeneration of the horses. The wild entires drive out the young ones so long as they are strong enough, and, of course serve their own fillies, and this inbreeding is continued, perhaps for several generations. He believed he was correct in saying that there was not a single horse station in Australia free from this baneful influence, in spite of all precautions of the managers, and in his opinion they would never overcome the trouble until they exterminated these wild mobs. In the breeding of hackney, or carriage horses, the results of the most judicious selection of both sire and dam were often very disappointing. How seldom do they see brothers in blood resembling each other even in appearance, while in action and temper there was even greater disparity. To his mind, the secret lay in the fact that the so-called roadster classes were crossbreds, and the breeding from roadster sires could not be too strongly discountenanced. In endurance, pluck, and intelligence, the blood horse, or three-quarter bred blood was infinitely superior to any of the so-called roadsters. Mr. Robertson gave a number of illustrations that had come under his notice of the endurance and intelligence of the former. While he was sure the judicious breeding of horses would prove profitable, there were several drawbacks not experienced in the breeding of cattle and sheep. The first is the low percentage of foals, and the high death rate from accidents and epidemics. Then the horse must be kept till he is about four years old, and at that age to command a remunerative price he must be free from blemish and of perfect conformation. One of the secrets to be learnt in breeding roadsters was to secure the proper proportion of draught blood to give size and substance and of the thoroughbred which gives style, endurance, and quality. Excess of the former makes the animal suitable only for trolly or spring dray work, while the sacrifice of substance and size for elegance and activity will give light hacks, hunters, and buggy horses. In the breeding of cattle it is found necessary to spey, or in some other way prevent the inferior heifers from breeding, and he was convinced that until some such system in the management of horse stations was introduced, they would continue to perpetuate undesirable defects in their horses. The lack of style and pluck in so many roadster horses was due mainly to the mating of these crossbred sires and mares, but the progeny of a roadster mare put to a thoroughbred or pure draught horse will inherit the best characteristics of their sires. For light hacks, hunters, and buggy horses the former cross would prove satisfactory, whereas the draught cross should produce wagon or trolly horses possessing fair activity and undeniable stanchness. For the Indian remount service, he believed in mating half-bred blood and draught mares with a thoroughbred stallion. For the best type of wagon or plough horses, he would recommend two strains of draught to one of blood; he would mate the draught mare with a blood horse, and the fillies from this cross with a draught stallion, to secure the desired result. To breed roadster horses in large numbers, he would on the ground of cheapness, buy broken down buggy, hack, spring dray, and coaching mares, and mate them with draught entires. The fillies from these mares would be the nucleus of his stud, and afterwards he would use nothing but compact, elegant blood stallions, possessed of good legs. In regard to the proposal to impose a tax on stallions as a means of raising the standard of their horsestock, he was afraid the result would be disappointing, as no matter how good the stallions may be, unless they are judiciously mated, the present state of affairs would continue. Still, he would favour a tax on all stallions offering for hire, and distribute the proceeds in prizes for stallions.

Angaston, September 5.

Present- Messrs. Snell (chair), A. and W. Sibley, Smith, Rundle, F. and A. Salter, Player, Thorne, Matthews (Hon. Sec.), and two visitors.

Ringbarking Currant Vines.--Mr. F. Salter read a paper on this subject as follows - It has now become so much a matter of practice to ringbark the currant vine in districts where hot winds prevail, and also where the soil is not of a particularly loose, water-holding nature, that it behoved them to look closely into the probable effect and apparent result which ringbarking shows on the vine at this period. Ringing the vine consists in taking a small portion of bark out in a ring around the stem. For this purpose different mechanical appliances have been constructed, but so far he had seen nothing which has proved so successful as a plain sharp knife in the hands of a careful man. An experiment which he and others tried is to cut around the stem with a sharp knife as far in as the wood, loosening the bark slightly at the same time. This had much the same result as ringbarking, though he thought the fruit was a little smaller; he had noticed that the wider the strip of bark taken out the larger the fruit, and the less likely to be a good black colour, as well as being later in ripening. Where the vine is not shaded by leaves he considered it a good plan to place a strip of linen rag just over the incision, tying it above the cut with a piece of string. This affords protection from the sun's rays, and tends to keep in any sap which exudes out from the incision and to gum the cut over and so hasten the healing process. There was no doubt that the result of ringing has a very weakening effect on the growth of the vine. He had recently made a trip to Clare with a view to seeing the effect of ringing. The wood made by the vines in one currant vineyard being only approximately one-third the growth made in comparison with what he saw three years ago on a previous visit to this district. Again, in another vineyard, the owner told him that the previous year they had about three times the quantity of cuttings from their vines, in comparison with this last year; in fact all those who have been ringing have noticed that the vines if the ringing is continued gradually make less and less wood. Another result noticed was that the stems of the vines have a tendency to thicken above the incisions. This is more noticeable of course in vines ringed for some years. One of the Clare growers stated that he intended doing very little ringbarking, as though the crop was better from ringbarked vines the sample was not as good, and they got good crops without resorting to this expedient. Others intended to continue ringing, but were afraid they would have to discontinue owing to the effect on their vines. The effect on the vine of ringing has been discussed considerably. Some people consider that the sap flows up through the wood cells and back by the bark or bast. In consequence of the backward flow being cut off at the stage when the fruit is just forming, the vine is flooded with sap above the incision, the result being a particularly good set of the berries. Even should a hot wind prevail it is unable to work its disastrous effect, owing to the berries being so well supplied with sap. The period of setting is, as all currant growers know, the risky time when the berries are growing from an oval to a round shape, and becoming firmly attached to the vine, this excessive supply of sap enabling the vine to set its fruit. Again, another theory is that the check given to the growth of the vine weakens it, and that there is a law in Nature that when a plant feels itself weakening, and death so to speak drawing nigh, it exerts all its powers to reproduce its kind, consequently the quantity of fruit set is abnormally large. Professor Perkins's idea on the action of ringbarking and the flow of the sap is given in the January and February numbers of The Journal of Agriculture of this year. There can be no doubt that ringing has a very weakening effect on the vine, and would probably kill the vine if continued without a break from year to year. Therefore it is necessary for them to look round for some method of renewing the vine. For this purpose layering a shoot from each vine, and consequently starting a new vine, seems a practical and sensible suggestion. Of course it will take some time for a young vine to spread its roots and become as vigorous as the parent vine, but if large crops are taken from the land it will pay to manure heavily and so bring on the young vines as quickly as possible. It will be necessary to leave the layered vine attached to the old vine until nearly the time of grubbing out. Another method suggested is to grow the vine somewhat on the system of the Bordelais Spalier, except that the rods left should not be taken out each year, but ringbarked, and spur-pruned after they are one year old. While these are being ringed, fresh rods should be grown from spurs below to replace the ringbarked ones when cut out. This method can be adopted most easily on the T piece trellis. There are many other suggestions, such as planting fairly close, and ringing alternate vines, in a two-armed vine ringing one rod only, but whatever the method is, something of the abovementioned, or even planting a fresh vineyard, should be taken in hand by the currant grower if he intends to make provision for the extinction of his vines from continued ringbarking. Special attention should also be given to the manuring of vineyards, also to thorough cultivation, as both these methods tend to keep the vine vigorous. Members generally had noticed similar results from ringing, and agreed generally as to the necessity for making provision for the renewal of the vineyard when the vines have become so weak as to be unprofitable. It was thought better to ring only portion of the vine until more experience as to the ultimate result was obtained.

Cherry Gardens, September 8.

Present—Messrs. Potter (chair), Wright, C. and J. Lewis, Hicks, Partridge, Jacobs, Matthews, Broadbent, Burpee, and one visitor.

Cape Tulip.—Messrs. Ricks and Metcalf forwarded specimens of the posionous Cape Tulip for information of members. It was thought the district was as yet free from this weed, and members considered landowners should do all in their power to prevent its introduction.

Koolunga, September 3.

Present—Messrs. Butcher (chair), Button, Sandow, Butterfield, Jose, Cooper, Perrin, Buchanan, Noack (Hon. Sec.), and one visitor.

Working Fallow Land.—Mr. Sandow initiated a discussion on this subject. He had noticed very great difference of opinion among farmers on this very important question. He was totally opposed to summer fallowing in the dry areas, and would commence work as soon as possible after seeding was finished About a month after ploughing he would harrow well, and give similar treatment after each rain, taking care not to work the land when too wet He did not approve of skim ploughing, as it was not advisable to turn the land up twice. Mr Butcher would harrow immediately after ploughing, and did not think it wise to cultivate too much. He thought rolling should be practised more than it is. Mr. Button did not consider it possible to cultivate too often, provided the land was neither too wet nor too dry. He would harrow directly after ploughing, but it might not be advisable to do so on all soils.

Wepowie, September 2.

Present—Messrs. Gray (chair), Smith, Gale, T. and J. Orrock, Fisher, Roberts, Bishop, Crocker, Hanna, Halliday (Hon. Sec.), and five visitors.

Poultry.—Mr. Hanna read a paper on this subject. There was no doubt that poultry was a financial help the farmer could not do without, yet strange to say, the farmer as a rule paid less attention to his fowls than to any other stock. Generally the care of the fowls falls upon the womenfolk. who have to get along with makeshift houses, perches, &c. If the farmer or his sons were to give a little careful attention to the fowls it would be easy to double the profits. It was a great mistake to go in for a number of breeds, as the farmer had not the necessary time or conveniences for keeping them separate. There was more profit and satisfaction in keeping only one breed under such conditions: what they wanted was a good layer, which at the same time made a fair table bird. Cleanliness was imperative—too much attention cannot be given to this point. If the yards are fixed it would be as well to plough or dig them over every six months or so. The floors of the houses should be removed occasionally, and fresh soil put in place thereof All material that will afford harbour for vermin should be avoided in building fowlhouses. Special attention must be paid to the drinking water, and to the vessels to hold it. A good dust bath should be provided in winter in a place sheltered from rain; in summer it was not necessary in this district to provide dust baths. One of the members found his poultry unprofitable, but generally members agreed that there was profit in fowls.

Inkerman, September 1.

Present—Messrs. Smart (chair), Kennedy, Lomman, C. H. and C. E. Daniel (Hon. Sec.), and three visitors.

Working Fallow Land.—This subject was well discussed. Mr. Kennedy would harrow well immediately after ploughing, and let the sheep keep the land clean. Mr. Lomman preferred to destroy the weeds with the scarifier, which improved the condition of the soil, but it must not be used when the land is dry. For destroying weeds, Mr. C. H. Daniel used the skim plough, and also advocated the liberal use of weighted harrows; others opposed the working of scrub land as it caused it to drift, and the use of the harrows when the land was dry was also considered unwise. Several members thought that the roller should be used more on fallow land.

Horse-Breeding.—Members were agreed that the best time to put the mare to the stallion was in September. The hon. secretary said that often when mares were put to travelling stallions the service was too late, and it was difficult to catch the mares in

Whyte-Yarcowie, September 19.

Present—Messrs. Hack (chair), Hatherly, Faul, Dowd, Mitchell, Francis, Hunt, McLeod, Makin, Mudge, Jenkin, and Boerke (Hon. Sec.).

Annual Report.—Eleven meetings held, with an average attendance of 8.8 members. Three papers have been read, and experiments with manures carried out by two members. Messrs. B. J. Hack, J. Hatherly, and G. Boerke were elected Chairman, Vice-Chairman, and Hon. Secretary respectively. Messrs. Dowd and Hunt reported on proceedings of annual congress.

Selfsown Crop.—Mr. Dowd stated that on land cropped and manured last year he had a strong, healthy, well-rooted crop of selfsown wheat, which made a very early start. Feed also had for several years grown better on the manured land, showing that the value of the manure could not be estimated by the first crop only.

Kapunda, September 6.

Present—Messrs. Shannon (chair), Flavel, Morris, Banyer, Teagle, Holthouse, Weckert, O'Sullivan, and Kerin.

Annual Report.—Ten meetings held, with average attendance of nine members. Six papers had been read and discussed, several gardens and vineyards visited by members, and in June Mr. G. Quinn gave them demonstrations in the pruning of fruit trees and vines. Messrs. W. M. Shannon and G. Harris were re-elected Chairman and Hon. Secretary respectively.

Poultry.—At the invitation of Mr. J. von Bertouch members visited his poultry farm, and were greatly pleased with what they saw. Mr. von Bertouch referred to his experiences as a poultry farmer, and explained his methods of feeding and other matters connected with the work.

Johnsburg, September 5.

Present—Messrs. Chalmers (chair), Potter, Hombsch, McRitchie, Redden, Luckraft, Buchanan, Johnson (Hon. Sec.), and three visitors.

Horse Disease—Mr. Hombsch read a short paper on a complaint of horses known locally as "stomach stagger," or "sleepy stagger." He had known of a number of cases of this complaint, and mostly they had a serious ending. The symptons appear to indicate that both the stomach and nervous system are affected. The chief cause appears to be bad food or to food being swallowed hastily without proper mastication after a long fast. He had heard of cases where up to 60 lb. of hard undigested food had been found in the stomach. The bowels of the affected animal become constipated, and the excrement is hard and slimy, little or no water is passed, and occasionally the bowels are attacked with spasms. The animal will paw the ground, look round his flank, lie down and roll about, sometimes wind is belched, and a partial sweat breaks out. The mouth and eyes are dull and yellow. The complaint finally ends in a state of coma; the horse is dull and sleepy, hangs his head on the manger or rests against the wall; the eyelids are closed or nearly so, and the animal appears insensible to light. Breathing is slow and laboured, pulse full, frequent, and oppressed. To do much good, the treatment must commence early. Give ½ oz. aloes in ½ pint of water, follow with nux vomica every two hours; if no relief is obtained in 12 hours repeat this treatment. Let the horse drink as much water as it likes, and give only bran mashes or green food until it has recovered. Several members reported experience with similar cases, and thought the treatment outlined suitable. Mr. Potter recommended giving one pint raw linseed oil, one tablespoonful of saltpetre, and 10 drops laudanum in warm water, which should be repeated in two hours if relief is not obtained. Mr Redden found that two tablespoonfuls of carbonate of soda in a quart of new milk an effective remedy for horses that had partaken too freely of wheat. New milk and flour would also relieve purging.

Crystal Brook, September 5.

Present—Messrs. Pavy (chair), W. and A. Hamlyn, Townsend, Hutchinson, Davidson, Morrish, and Symons (Hon. Sec.).

Northern Conference.—It was decided to write to the various branches interested to ascertain whether Gladstone or Crystal Brook would be the more convenient place for holding the 1904 conference of northern branches.

Clean Wheat.—Mr. R. Townsend read a paper on this subject. As a buyer of wheat he had been strongly impressed with the marked differences in the degree of cleanness of wheat supplied by different farmers. He, as a buyer, must adhere to the prevailing custom, yet he could not but feel that it was an injustice to many farmers. The grower who puts his wheat through the winnower only once, and yet leaves in it cracked grain, foreign seeds, &c., gets just as much per bushel for the wheat if it reaches the f.a.q. standard, as the grower who thoroughly cleans his wheat, which may weigh up to 65 lb. or even 67 lb. per bushel. How was this difficulty to be overcome? He thought there were two means; first raise the standard and compel the slovenly man to clean his wheat, or pay ½d. to 1d. per bushel more for the better wheat. Another method would be to offer some inducement to the men cleaning the wheat. This is usually done at so much per bag, and if the cleaner does his work well, he can easily get from 44 to 45 bushels in 10 bags. It would be to the advantage of the farmer to pay for this extra bag, as he would have less bags to pay for, less sacks to handle, a better sample and more screenings for pigs and poultry.

Willunga, September 5.

Present- Messrs. Pengilly (chair), Richards, Blacker, Allen, Atkinson, Malpas, Brown, Binney, Kernick, Vaudrey, and Hughes (Hon. Sec.).

Currant Growing.- Mr. Brown read a paper on this subject. Of late years a good deal of attention has been devoted to this industry, and in some quarters there appears to be a fear that currant growing will be overdone. Granting that 12 cwt. per acre of dried fruit was a fair crop, it will require the produce of 11,000 acres to supply the 7,000 tons of currants annually consumed in Australia. He thought, therefore, that it was hardly possible for planting to be overdone for some time to come at any rate Those in the field first will, of course, reap the best harvest, but producers must not expect to realize such high prices as have prevailed of late. The natural increase in the population, and a reduction in the price of currants will, however, largely increase the consumption of that article. The currant grower must not expect to get his crop year after year without fail once the vines come into bearing; from blooming to setting must always be an anxious time, as the ultimate crop will be largely affected by the weather prevailing at this time. The currant vine adapts itself to a variety of soils, but will do best in deep, rich, well-drained alluvial flats, and on light soil with a good clay bottom. Swampy land badly drained and cold must be avoided Before planting the land should be ploughed as deep as possible, and well worked to secure a mellow surface; it will pay to run the roller over the land, and also to get some experienced man to do the "striking out" with a plough, as by this method, it is easier to keep the vines straight. In setting out the rows ascertain the direction of the prevailing wind, and plant up and down, instead of broadside on to the wind. Trellis the vines if possible. The distance apart to plant, will depend upon the nature of the soil; in strong soil 18 ft. to 20 ft., and in poorer land 12 ft. to 15 ft. will be a fair average in the rows. The rows should be about 12 ft. apart, especially if the crosshead trellis is adopted. It was best to plant well-rooted young vines, as there will be a far better take than with cuttings. To obtain the best results, dig out a hole and loosen the subsoil where each vine is to be planted; do not expose the roots of the vine more than necessary during planting operation. It will be found a good practice to keep them wrapped in a damp bag or cloth. For the first year's pruning, trim off all shoots except the strongest, and cut this back to one bud, the following year again select the strongest shoot, and cut it to two or three buds, suppressing all the others. Stake the vines as soon as possible, and selecting the shoot that is to form the stem, tie it to the stake, and rub off all the others. If this is done, the vine will be ready to go on to the trellis earlier than if not attended to at this period. There were a number of different forms of trellis adopted; in McLaren Vale district the T or crosshead was generally favoured; while another he would refer to was a three wire trellis, one above the other, with the vines pruned on the Sylvoz Cordon. The former has been frequently described in The Journal; the three-wire trellis is constructed of No. 8 wire, the middle one being 2 ft. 6 in. to 3 ft. above ground level, the top wire 10 in. to 20 in. above that, and the lower 10 in. to 16 in. below the middle. The object is to train the main arm or arms along the middle wire, to tie the rods to the bottom wire, and the growth for next year's rods to be the top wire. For their district, he preferred this system, as being very windy, the closer they could keep the vines to the ground the better. Certainly the crosshead being higher, makes it more convenient for ploughing close up to the vines, but at 2 ft. 6 in. in height they would be greatly in the way; this system is also considerably more expensive than the three-wire trellis. The fact that they were not subject to late frost to any extent made the low trellis more suitable to their conditions. He considered 2 ft. 6 in. quite high enough for the middle wire, and would prefer the lower wire only 12 in. beneath it, as he found that with a long rod, the growth from the buds was weak and spindly. In pruning vines trained on the Sylvoz Cordon the vine is ready to go on the trellis at three years. No rods should be left on the young wood, and it was a mistake to overload the vine with wood while training it to occupy its allotted space. The growth made the previous season should be cut back to a healthy bud (regulating the length according to the vigour of the shoot) and this should be repeated each season until the arms reach their full length. On the wood of the previous year to this being obtained, spur the canes to two buds, leaving 12 in. to 14 in. between each cane, cutting away all other growth as close to the main arm as possible. The growth from these spurs should give the wood to work on next year; one to form the rod, and the other to be pruned as a spur of two buds from which the next season's wood is to be obtained. The rod when it has served its purpose is cut off as close as possible to the vines. In pruning the rods, cut them through a node, bend it down at a sharp angle, and secure with wire to the lower wire. Do not leave any canes near where the arm is bent over along the middle wire, as the growths nearest this bend will be excessive, and will diminish the vigour of the shoots further away. Considerable discussion followed. One member preferred to plant across the line of prevailing winds; another fastened the rods to the top wire instead of to the bottom wire. In reply to a question, Mr. Brown said, although he found the strong gully winds troublesome and injurious, he was satisfied with his returns.

Naracoorte, September 4.

Present—Messrs Forster (chair), Wardle, Buck, Duffield, Caldwell, Coe, and Schinckel (Hon. Sec.).

Planting Fruit Trees.—Mr Duffield read a short paper on this subject. Before planting, the ground should be thoroughly worked. Plough as deep as possible, using a subsoil plough in the furrow to break up the lower soil. If this is done, there is no necessity to dig out holes for the trees, a practice he did not like. Plant the trees shallow, putting as much surface soil as possible on the roots; if the land is well prepared, the roots of the trees will find their way downwards. In this locality he would set out the trees about the end of June, and would prune hard back. Crops like barley should not be sown in the orchard, as the trees would suffer. In dealing with aphis on peaches and nectarines, he found the application of 1 lb. of sulphate of iron and 4 lb. new lime in 20 gallons of water effective.

Papers Read at Branch Meetings.—The Chairman directed attention to paper read at Minlaton on "Dairying," by Mr. E. Correll, and on "Farm Economy," by Mr. Cornish of Stansbury branch.

Caltowie, September 1.

Present—Messrs. Hewett (chair), Graham, Kerr, Royal, Petatz, Potter, J. and A. McCallum, McDonald, Connors, Neate, J. G. and F. Lehmann (Hon. Sec.).

Question Box. In connection with enquiry as to what length of time after calving should elapse before the milk is used for consumption, members thought it depended upon the cow, and also upon the season; usually, however, three or four days were sufficient. Difference of opinion existed on the value of separator milk for calves. Most members considered it a very suitable food by itself, but Mr. Kerr said calves fed on separator milk had nothing to recommend them.

Mannum, September 19.

Present—Messrs. Preiss (chair), Faehrmann, Schulze, Lenger, Ramm, Wilhelm, Schuetze, and Richardson (Hon. Sec.).

Business.—Messrs. Preiss and Schuetze reported on proceedings of annual congress in Adelaide. Discussion took place on the prospects of the season, and it was agreed that unless very unusual circumstances intervened the late rains had ensured a fair crop.

Officers.—Messrs. J. G. Preiss, F. E. Schuetze, and F. Richardson were elected Chairman, Vice-Chairman, and Hon. Secretary for ensuing year.

Strathalbyn, September 21.

Present—Messrs. Rankine (chair), Reed, Meikle, Blake, and Cheriton (Hon. Sec.).

Congress.—The Hon. Secretary reported on proceedings of annual congress, with which he was very well pleased. He desired to congratulate the officials on the businesslike manner in which the meetings were carried out. Mr. Cheriton also tabled samples of phosphate rocks from Christmas Island, and from the local deposit at Clinton.

Hon. Secretary.—Mr Cheriton tendered his resignation as hon. secretary on account of the lack of interest shown by the majority of the members in the work of the branch.

Clarendon, September 23.

Present—Messrs. J. Spencer (chair), Payne, W. Spencer, Pelling, A. and A. A. Harper, Phelps, Nicolle, Piggott, Wright (Hon. Sec.), and several visitors.

Cape Tulip.—The hon secretary tabled specimens of this weed, which he had noticed in one or two parts of the district, and strongly urged members to destroy the plants before they spread, and while the work could be accomplished at small cost.

Horse Breeding.—The Hon. Secretary read a paper on the most useful horse to breed for farm purposes. It was decided to ask the Hon. Secretary to read the paper at Cherry Gardens Conference on October 6.

Port Elliot, September 19.

Present—Messrs. Brown (chair), Green, Basham, Inglis, Pannel, W. E. and W. W. Hargreaves (Hon Sec.).

Milk Testing.—Members are of opinion that every farmer who keeps a number of cows should use the milk tester to ascertain which cows were profitable and which unprofitable; the latter should be got rid of.

Grazing and Farming.—Mr. Basham read a short paper on this subject. He would divide the land into as many paddocks as it was convenient to fence them, as it would enable them to change the stock frequently from one paddock to another; sheep especially will benefit from this practice. Take the greatest care not to overstock; it was better to let a little feed waste at times. Stock in good condition can always be readily disposed of at market rates, but poor stock are difficult to sell even at low prices. After sheep have been grazing on the paddocks for a few years it will be found that they do not care for the feed growing on the places where they have camped. Horses or cattle, however, will eat this rank growth and do well on it. He found on the paddocks he cultivated that after grazing with sheep for two or three years, and then ploughing the green stuff under, he could get two good crops of oats in successive years. By dividing the land into small paddocks, and grazing as described, they could get clean crops if they sowed clean seed. He did not altogether like the use of commercial fertilisers; he thought they should first analyse the soil to ascertain what was wanted, as it was wasteful and might even be harmful to apply some manures. The requirements of the land would naturally vary according to the differences in the soil.

Forest Range, September 3.

Present—Messrs. Monks (chair), Gunn, Rogers, Hackett, Vickers, A., H. and F. Green (Hon. Sec).

Lucerne.—Mr. W. J. Gunn read a paper on this subject, dealing with reports on results obtained in the other States, and quoting as follows from a bulletin issued by the Kansas Experiment Station:—"The ground should be worked deep and all clods thoroughly broken up, but it must be allowed to thoroughly settle down before seeding and only the surface kept loose. Lucerne will generally fail if sown on freshly-ploughed land. When the ground has been ploughed it must be harrowed thoroughly, making a good seed bed, and then wait till a good rain has settled the soil before seeding. The ground must be deeply pulverized, well settled, with a good mulch on the surface, and saturated with moisture so as to bring up the seed quickly and force the growth. If any of these conditions are lacking do not sow. The chief causes of failure are:—1. Poorly prepared soil. 2. Loose soil at time of planting. 3. Early and excessive pasturing. 4. And allowing weeds to get ahead of new seeding. In general it may be said that autumn seeding is advisable wherever the proper conditions of the ground in regard to seed bed, moisture, and mechanical conditions are procurable. We recommend 20 lb. of seed to the acre. With every condition favourable lucerne growers have succeeded with as little as 10 lb. to the acre. Where climatic conditions do not indicate favourable seasons as far as moisture is concerned, 30 lb. ought to be used to secure a strong crop, for growers must remember that lucerne, unlike clover, never thickens, and the number of plants per acre tends to continually decrease. If the soil and air are moist, the strongest and most even stand is obtained by broadcast sowing, cover lightly with a harrow, and then roll. If the weather is dry and there is much wind, broadcast sowing will in nine cases out of 10 be a failure. The seed will germinate near the surface, and the wind dries out the soil and kills the young, tender plant. Generally, the best way to sow is by a press-drill. Mix the seed with equal parts of bran or fine sawdust, drill and cross-drill, sowing half the seed each way. If a hoe or disc-drill be used, care must be taken not to get the seed too deep. Lucerne must be sown alone; it does not need a nurse crop. Sometimes a good result is obtained when lucerne is sown with some other crop, but many times it fails utterly. Young lucerne is a delicate plant and needs all the moisture, plant food, and sunshine available, and when it has to share these with other crops it usually fails. One cwt. of superphosphate to the acre at time of sowing will give the young plant a splendid start, and as it thrives wonderfully on a limestony soil a dressing of lime could be added with profit if the soil is deficient in that respect. On most land spring-sown lucerne will need to be run over with a mower two or three times to keep the weeds down. The mower will need to be set high, and the weeds mowed down often, so that they will not smother the lucerne. Some growers mow the lucerne three or four times the first year, as they find the pruning of the young plants makes them vigorous. The cut vegetation should be left on the ground as mulch. If mowing has been delayed till the weeds are heavy it is often necessary to mow and rake the weeds off the ground to prevent the lucerne being smothered. Autumn-sown lucerne needs no attention until the following spring, when the crop will be ready to cut for hay. No stock of any kind should be allowed to graze on lucerne during the first year of its growth. When young lucerne is grazed close a crown cannot form, and continued cropping weakens the root, and the plant dies. If old lucerne is closely pastured, and the branches forming the crown are eaten off, there is no way in which the plant can throw up new stems, and it dies. Moderate grazing and mowing leave the plant uninjured. When the crown is bruised as in harrowing or discing, new buds are developed, and the number of branches or stems thrown up by the plant increases. Cutting acts as a tonic to lucerne. Whenever it does not thrive cut it. This applies throughout the life of the plant. In times of prolonged drought it will bloom when only 5 in. or 6 in. high. Cut it as soon as the first blooms appear, even if it is so short that the hay cannot be raked, and has to be left to waste on the ground. The vigour of growth and the yield of crops later on will considerably balance this waste. When lucerne is cut and fed green it is usually cut before any blossoms appear. When this is done a much greater total growth for the year is secured than when cutting is delayed until the bloom appears, but it is not practical to cut for hay till the bloom does appear. It is recommended that the crop be disced early in the spring, before the growth has started. Disc immediately after each cutting, no matter how often cut. In dry hot weather it should be disced the same day as cut and hay removed. A week's exposure to sun and winds without discing may cause the evaporation of an inch of moisture. If the stand is a fair to good one, set the discs at the least angle at which they will turn the soil over and weight the disc to make it cut the crowns. If an old field, and the weeds thick, set the discs at as great an angle as possible, and if this does not tear the soil and lucerne roots pretty thoroughly then cross disc with discs at same angle. Lucerne should be cut for hay when about one-tenth of the plants have come in bloom. If cut at this early stage the yield for hay for the season will be much greater than if nearer maturity, and every pound of hay secured will be worth more for feed. The leaves of lucerne contain nearly four times as much real food matter as the stems Every effort should therefore be made to save all the leaves possible. When lucerne has made slow growth, and the ground and weather dry when cut, there is no difficulty in curing. Often under these conditions it is safe to rake within a few hours of mowing, and stack a few hours after the lucerne has been put in cocks. When it has made a rapid growth, and is rank and succulent, and weather and ground damp, the problem is a difficult one. The leaves will easily dry, but the stems will contain a lot of moisture after the leaves are even too dry. Lucerne hay should become so dry before stacking that when a handful of stems are twisted no moisture should be squeezed out. When conditions for curing are favourable it is a good method to cut early in the morning when the dew is off; allow it barely time to settle on the ground, then rake, and before night put into narrow tall cocks. After the dew is off next morning, and the surface of the ground dry, open these cocks carefully so as not to scatter the leaves. If weather is favourable the hay may be stacked in the afternoon; if not, it must be recocked and the treatment repeated until it is properly cured."

* * *

DATES OF MEETINGS OF BRANCHES OF THE AGRICULTURAL BUREAU.

With a view of publishing in the "Journal" the dates of meetings of the branches of the Agricultural Bureau, Hon. Secretaries are requested to forward dates of their next meetings in time for publication.

BRANCH	Date of Meeting.		BRANCH	Date of Meeting.	
	1903	1903		1903.	1903.
Amyton ..	Oct. 8	Nov. —	Nautawarra .	Oct. 7	Nov. 4
Arthurton ..	2	—	Naracoorte .	10	14
Balaklava .	10	14	Narridy	17	—
Booleroo Centre ..	6	3	Norton's Summit ..	2 & 30	—
Bowhill ..	—	7	Onetree Hill	1	5
Brinkworth ..	2	6	Orroroo .	16	–
Burra ..	9	13	Penola .	10	14
Bute ..	3	—	Petersburg .	2 & 31	Dec. 3
Cherry Gardens ..	13	10	Pine Forest .	6	Nov. 3
Clare ..	2 & 30	—	Port Broughton .	1	5
Clarendon ..	12	—	Port Elliot ..	17	21
Colton ..	3	7	Port Lincoln ..	16	20
Crystal Brook ..	3	7	Port Pirie ..	3	—
Elbow Hill ..	6	3	Pyap ..	7	4
Eudunda ..	5	2	Red Hill .	6	—
Finniss ..	5	2	Reeves Plains .	2 & 30	—
Forest Range ..	1	5	Rhine Villa .	2 & 30	Dec. 4
Gawler River ..	2 & 30	Dec. 4	Riverton ..	3 & 31	—
Inkerman .	6	Nov. 3	Stansbury ..	3	—
Johnsburg ..	3	—	Strathalbyn ..	19	Nov. 16
Kanmantoo .	2 & 30	—	Virginia .	5	2
Kapunda ..	3	7	Wandearah ..	5	2
Kingston ..	3	7	Watervale .	5	2 & 30
Koolunga ..	1	5	Wepowie ..	—	4
Maitland ..	3	7	Whyte Yarcowie .	17	21
Mallala ..	5	2	Willunga	3	7
Mannum ..	17	21	Wilmington	7	4
Minlaton ..	24	21	Woodside ..	5	—
Morgan ..	3	—	Yankalilla ..	2	—
Mount Compass ..	10	—	Yorketown ..	10	–
Mount Remarkable ..	1	5			

VENTILATION OF FACTORIES AND WORKROOMS.

CONTRIBUTED BY THE CHIEF INSPECTOR OF FACTORIES.

(Abstract continued from page 135.)

VENTILATION BY FANS

Ventilation by fans has the great advantages that (1) practically unlimited quantities of air can be supplied; (2) the supply is completely under control, so that it can always be relied on; (3) the incoming air can be warmed, moistened, or filtered from soot; (4) dust and fumes can be removed at or near the points where they are given off. These advantages are so great as compared with the cost involved that where large engine power or electricity is available mechanical ventilation is now very largely used in factory ventilation, even in rooms which are not crowded.

A fan may be placed in either an inlet or an outlet for air, the best arrangement for any particular case depending on circumstances. If it is necessary to warm, filter, or moisten the incoming air the fan should, as a rule, be in an inlet, so that no untreated air can enter the room. On the other hand, if the incoming air has not to be treated the most convenient position is usually in an outlet placed high up. The incoming air then enters through the walls, roof, and various openings. The incoming air currents should be so directed and subdivided as to secure proper distribution of air and reduce draught to a minimum. In rooms of great superficial area several fans are needed to secure proper distribution, and often a combination of inlet and outlet fans is advantageous. Where a fan is used for the removal of dust, steam, or fumes which are escaping into the air and cannot be dealt with at their point of origin, the fan should be placed so as to draw off the vitiated air as directly as possible, and particularly not to draw it across the room. Mistakes as to this point are not infrequent. Proper heating arrangements must of course be combined with fan ventilation, whether or not the incoming air is heated.

For purposes of general ventilation, where the difference of pressure on the two sides of the fan is, or ought to be, practically inappreciable, fans of the simplest construction, and with a minimum of internal resistance, are employed. They are usually of the propeller type. The propeller fan resembles the screw-propeller of a steamer, and is set in a circular opening, through which the air is propelled by the rotation of the fan. Assuming that there is no difference of pressure in the air on the two sides of the fan the whole of the energy communicated by the motor to the fan, with the exception of what is wasted in friction, is expended in setting the air in motion. Part of this motion is, however, lateral, and therefore useless, so that with a propeller fan only about 40 per cent. of the energy communicated to the air or less is expended in driving it in the required direction parallel to the axis of the fan. Even so, however, the volume of air which can be propelled with a trifling expenditure of power is enormous. With a simple three-bladed fan, 2 ft. in diameter, and revolving 600 times per minute, Mr. W. G. Walker found that with the best arrangement of blades 42.8 per cent. of the energy communicated to the air by the fan was expended in driving it forwards. The fan was delivering 2,450 ft. of air per minute, and the horsepower communicated to the air was .0334 (Proc. Inst. of Mechan Engineers, Nov., 1897).

The volume of air moved by a fan varies directly as its rate of revolution, and the work done on the air varies as the square of the velocity of the air current, so that the work done by the fan varies as the cube of its rate of revolution. It is thus an economy of power, as well as of wear and tear, to employ a fan of sufficient size not to require a very high rate of speed.

When a fan is working against resistance the energy expended in driving forwards the air is greatly increased, and with a certain back pressure a fan working at a given velocity will practically cease to drive forward any air. With propeller fans in particular this limit is soon reached; for since the velocity with which the blades are moving is much less at the centre than at the periphery of the fan, a much smaller pressure will suffice to drive air backwards through the centre than at the periphery, so that with the increasing resistance there is more and more loss of useful effect from this cause, and finally the fan is practically churning air round and round within itself. We have frequently observed fans which were inefficient from this cause. Where a propeller fan, or duct leading outwards from it, opens on the side of a building exposed to the wind the pressure of the wind may easily cause so much air to blow backwards through the centre of the fan that the current is for the time completely reversed. We have observed this, for instance, in a case of a fan being used for removing dust. The latter was being blown in the face of the workmen instead of being drawn off. The fan was too large for the work required of it, and was consequently being run at a very low velocity. The passage of air backwards through the centre of a propeller fan can be remedied without increasing the speed by blocking the central part, which is of little use under any circumstances. The fan will then work efficiently against a much greater adverse pressure.

Where the fan is not completely boxed in by a surrounding tube, and the blades are not so constructed as to prevent lateral escape of air, adverse pressure from wind or other resistance will cause the air to escape laterally instead of being driven through the fan. If this escape occurs on the side of the fan from which the air is coming its efficiency may be almost completely destroyed. It may thus happen that a fan placed in a certain position will drive air efficiently in one direction, but not in the opposite direction.

When a fan is exhausting or propelling air through a duct it is evidently of great importance to keep the resistance offered by the duct within a reasonable limit. The resistance depends largely on the work expended in imparting velocity to the air, and this work, as already seen, increases in proportion to the square of the velocity of the air current. Hence it is very important that the duct should be of such a size at all points that the velocity is moderate. As a general rule a duct or its combined branches ought to have a cross sectional area equal to, or somewhat greater than, that of the fan opening; and where, as often occurs, it is necessary to restrict the size of the ducts and use rapid air currents, a form of fan with correspondingly restricted opening, and working efficiently against correspondingly increased pressure, should be employed. An ordinary open propeller fan is useless in such a case, for the reasons just explained, and a centrifugal fan is best. For the purposes of general ventilation, however, it is evidently preferable to employ fans and ducts with wide openings, and to run the fan at the lowest velocity which will secure under all conditions a sufficient air current. It should also be borne in mind that at every point which the air has to pass at an increased velocity due to narrowing or obstruction of the duct there is great increase of the work required to move the air, since the work increases as the square of the velocity. If a propeller fan 2 ft. in diameter or 3.14 square ft. in area is drawing its air supply through a duct narrowed at one point to one square foot in area the output of the fan, when running at a given velocity, has been found to be reduced to about a third of what it would otherwise be.

A rectangular bend in a duct has been found to produce a resistance equivalent to that caused by an increase of nearly 50 per cent. in the velocity, or 100 per cent. in the pressure needed merely to set the air in motion at the same velocity. Sharp bends should therefore be avoided wherever possible. The loss at a bend is greatly diminished by making it gradual. There is also a loss at the entrance of a duct equivalent to that caused by an increase of nearly a third in the velocity, unless the opening is trumpet shaped.

Frictional resistance of the duct walls must also be taken into account. Its amount is proportional to the total internal surface of the duct, but inversely proportional to the sectional area. *It follows that the duct should*, so far as possible, be of such a shape as to present a minimum of internal surface with a maximum of sectional area, and that it is disadvantageous to subdivide an air current between several ducts. Frictional resistance depends also on the velocity of the air current. When the walls of the duct are perfectly smooth, as in the case of a glass tube, the resistance varies directly as the velocity of the air current. Where, as is almost always the case in practice, the walls are not very smooth, the resistance increases or diminishes more rapidly than in direct proportion to the velocity, but not so rapidly as in proportion to the square of the velocity. The resistance from friction thus does not vary with the velocity according to the same law as the resistance due to the work required merely to impart motion to the air; and frictional resistance is of greater relative importance with slow than with rapid air currents, and is also much more important with long than with short ducts It can often be more advantageously overcome by increasing the driving pressure than by increasing the sectional area of the duct.

Where there are several openings for the passage of air into or out of a duct these should be properly proportioned to give the required flow at each This is best done empirically with the help of an anemometer, or by using the flame of a candle or taper to judge of the velocity of the current at each opening

All air ducts should be accessible for inspection and cleaning, particularly if there is much dust in the air Accumulations of dust may greatly diminish the flow of air through a duct

(To be continued)

INDUSTRY.

SUPPLIED BY THE DEPARTMENT OF INDUSTRY

Labor Bureau.

Number of persons registered and found employment by Government Departments and Private Employers from August 27 to September 26, 1903

Trade or Calling	Number Registered		Number Employed
	Town	Country	
Laborers and youths	51	89	223
Carpenters	3	—	14
Cabinetmakers	—	—	1
Wagonmakers		—	1
Masons and bricklayers	1	1	3
Painters	1	—	11
Moulders	1	—	—
Blacksmiths and strikers	4	—	9
Enginedrivers and firemen	1	—	—
Fitters and turners	2	1	6
Ironworkers ..	1	—	2
Fencers	-	—	1
Miners	—	—	6
Well sinkers	—	—	2
Sculleryman	—	—	1
Compositors .	—	—	9
Attendants	—	—	1
Apprentices	9	3	3
Cleaners .	6	3	1
Porters and youth porters	7	2	6
Rivet boys	5	—	—
Totals .	92	99	300

September 27, 1903

A Richardson, Bureau Clerk

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Journal of Agriculture

AND

Industry.

[REGISTERED AT THE GENERAL POST OFFICE ADELAIDE FOR TRANSMISSION BY POST AS A NEWSPAPER]

No 4 NOVEMBER 1, 1903. VOL VII.

THE JOURNAL OF AGRICULTURE.

The officers of the Department of Agriculture have for a long time recognised that The Journal of Agriculture did not reach nearly as many of our producers as it should Believing that it would not only benefit the individual, but the State generally, if we could place our monthly journal in the hands of every producer suggestions were some time since made to the Hon Minister of Agriculture with a view to extending our sphere of usefulness It was proposed to make an annual charge of 1/, this is merely a registration fee, and is mainly intended to prevent those who would take no real interest in it applying for The Journal as they might do if it were quite free of any charge This proposal was submitted to the branches and with but one exception all those who considered the matter heartily support it

We are pleased to be able to announce therefore that the Minister of Agriculture has approved of our proposal, and that from the January issue of The Journal any one interested will, on the payment of the sum of 1/ per annum, receive The Journal each month as issued Will the members of the Agricultural Bureau please bring this matter under the notice of their friends and send on names and addresses of as many subscribers as they can secure together with the year's subscription

In connection with this question it would perhaps be as well to make a few remarks concerning the position of The Journal of Agriculture The following extract from the annual report of the Secretary for Agriculture sets out the departmental views on the matter – "I gather that not infrequently a tendency has been apparent in outside circles to look with suspicion upon this official publication, through a misapprehension of the scope of its work it has been deemed an unwarranted intruder in the precincts sacred to free and untrammelled journalism To my mind however, The Journal of Agriculture can only be looked upon as a journal to the extent that it appears at regular intervals, in every other sense it covers ground that the daily and weekly papers do no more than skim over It is the medium for the dissemination of technical papers written by officers of the Department, a record of departmental work, and of the transactions of the various branches of the Agricultural Bureau Such matters are of interest to a section of the community only, and it is but in the nature of things that the ordinary press could not afford to give them that prominence which, in the eyes of those they specially concern, they certainly deserve In my opinion The Journal of Agriculture trespasses on nobody's ground, nor shall it whilst I am allowed to continue at the helm Personally, I am of opinion that the publications, in which are to be found papers by the various experts of the Department, should be in the hands of every intelligent tiller of the soil"

ANNUAL REPORT OF THE DEPARTMENT OF AGRICULTURE.

[The following extracts from the annual report of the Secretary for Agriculture are published in The Journal for information of members of the Bureau.--Ed.]

FUTURE OF THE UPPER NORTH.

During the past season the failure of the crops in the upper north was complete and nothing that is said in reference to it can serve to paint the position in more favourable colours. Less than three-quarters of a bushel reaped from nearly half a million acres sown to wheat spells not only ruin to the unfortunate owners of the land, but indirectly involves the whole community in not inconsiderable losses. On such considerations there are not a few who have openly advocated the abandonment by the farming community of this vast tract of country that has, they state, been put under wheat at a time when the exact nature of the climate was not known. Without wishing to deny that the pioneer in his enthusiasm after pastures new may at times have gone further north than has latterly proved expedient, I cannot understand that anybody who is at all cognizant of what the north has yielded in the past, and who is not under the impression that drought is merely a temporary and not a permanent feature in our climate, can advocate the return to sheep of the whole of the upper north It is not as if the record of these tracts of country were represented over a long period of years by consistent failures, relieved here and there by an occasional good harvest. Better than any words of mine, a glance at Table IV will show what the much-abused north has done for us in the past, and but a little imaginative power will conjure up what may be expected from it in the future under improved methods of farming.

TABLE IV

SHOWING AREA UNDER WHEAT, BUSHELS REAPED, AND YIELD PER ACRE IN THE UPPER NORTH

Seasons	Acreage under Wheat	Wheat in Bushels	Yield per Acre
	Acres	Bushels	Bushels
1881-2	576,843	1,733,927	3 00
1882 3	640,529	1,744,782	2 72
1883-4	590,087	3,992,902	6 76
1884 5	600,750	4,880,980	8 12
1889 90	448,100	5,001,564	11 20
1890-1	475,250	3,019,476	6 35
1891-2	463.877	2,594,797	5 60
1892-3	463,191	3,110,219	6 71
1896-7	537,261	310,874	0 58
1897-8	510,754	653 216	1 28
1898-9	531,712	1,380,624	2 60
1899-1900	535,912	2,056,360	3 84
1900-1	552,932	1,898,176	3 43
1901-2	462,123	1,465,728	3·17
1902-3	482,494	345,360	0·71

PRICES AND MONETARY RETURNS FROM GROSS AGRICULTURAL PRODUCE.

That the success of an agricultural season is bound up with the prices that obtain when the proceeds of the harvest are marketed has already been adverted to. In the ordinary course of events our occupancy of an isolated and sparsely populated continent, however vast its area, implies that the prices of agricultural produce are settled for us elsewhere. It is a matter of common knowledge that during the past season the failure of the crops in the eastern

States enabled us in a measure to make our own prices. What this has meant to the farming community has generally been left to the individual imagination. I shall endeavour to reduce it to figures. I had originally intended estimating the total gross returns from the various agricultural industries and contrasting them with ordinary average returns. For this work I have been unable to collect the necessary data, and in lieu of our total gross agricultural revenue I have substituted the gross revenue from five of our staple products —wheat, oats, barley, hay, and potatoes. They will, I believe, illustrate with sufficient accuracy the influence of prices on the prosperity of the past season.

It may be pointed out here that, in view of the fact that no statistics were collected from 1892 to 1896, my average figures do not go back further than 1896-7. In Table V. are shown the mean prices that have ruled in successive seasons since 1896-7, contrasted with those that obtained in 1902-3.

TABLE V.

SHOWING MEAN PRICES FROM 1896 TO 1903.

Seasons.	Wheat.			Oats.			Barley (Malting).			Barley (Cape).			Hay.			Potatoes.		
	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.
1896-7 . ..	0	5	3	0	3	1	0	4	2	0	2	11	4	1	0	5	2	5
1897-8 . ..	0	3	10	0	2	10	0	4	5	0	3	2	3	0	0	6	16	6
1898-9 . ..	0	2	9	0	2	4	0	4	0	0	1	11	1	6	0	6	12	8
1899-1900 ...	0	2	9	0	2	4	0	3	2	0	2	1	1	17	6	4	0	0
1900-1 . ..	0	2	10	0	2	4	0	3	5	0	2	1	1	7	10	5	1	0
1901-2	0	3	2	0	2	7	0	3	9	0	2	6	1	18	6	6	9	9
1896-1902 ..	0	3	5	0	2	7	0	3	10	0	2	5	2	5	2	5	13	8
1902-3 . .	0	5	2	0	3	4	0	4	9	0	3	7	3	15	6	5	10	0

With reference to prices given in Table V. it should be stated that they represent the mean prices on the Adelaide markets, calculated for the whole season, from the published monthly reports in The Journal of Agriculture By multiplying these prices by the total returns of the respective seasons, and subsequently averaging them, we secure a standard by means of which the gross monetary returns of 1902-3 may safely be compared. These figures are shown in Table VI.

TABLE VI.

SHOWING COMPARISON OF GROSS VALUE OF STAPLE AGRICULTURAL PRODUCTS DURING 1902-3 WITH THAT OF PRECEDING SIX SEASONS.

—	Gross Value calculated at ruling Adelaide Prices of Crop in 1902-3.			Mean Gross Value calculated at ruling Adelaide Prices of Crops from 1896 to 1902.		
	£	s.	d.	£	s	d.
Wheat	1,641,686	0	0	1,122,980	0	0
Oats	103,471	0	0	37,081	0	0
Barley	63,431	0	0	26,975	0	0
Hay	1,165,814	0	0	585,400	0	0
Potatoes	155,716	0	0	81,979	0	0
Totals	3,130,118	0	0	1,854,415	0	0

Excess of season 1902-3 over average of six preceding Seasons, £1,275,703.

In the five lines of produce that have been reviewed there was, during the season 1902-3, an advance of over one and a quarter millions sterling in gross value above the mean figures for the six preceding seasons. When the general advance in prices of other lines is borne in mind, particularly in live stock of all descriptions, some adequate idea of the success of the past season will be realized.

I have already pointed out that the success of the past season was largely attributable to improved methods of farming that have recently come into vogue, and I am in a position to emphasize this fact by a very striking illustration. So far as weather conditions were concerned, the season 1896-7 was perhaps, on the whole slightly more favourable than 1902-3, whilst average prices for farm produce were slightly in excess of those that ruled during the latter season. In Table VII. are shown the gross values of the five lines of produce already referred to during these two seasons.

TABLE VII.

COMPARISON OF GROSS VALUES OF PRODUCE RAISED IN 1896 7 AND 1902 3.

—	1896 7						1902-3					
	Mean Adelaide Prices for Season			Gross Value calculated at ruling Adelaide Prices			Mean Adelaide Prices for Season			Gross Value calculated at ruling Adelaide Prices.		
	£	s	d	£	s	d	£	s	d	£	s	d.
Wheat	0	5	3	736,179	0	0	0	[illegible]	2	1,641,686	0	0
Oats	0	3	1	29,248	0	0	0	3	4	103,471	0	0
Barley	0	3	4	17,966	0	0	0	4	0	63,431	0	0
Hay	4	1	0	691 772	0	0	3	15	6	1,165,814	0	0
Potatoes	5	2	5	82,645	0	0	5	10	0	155,7!6	0	0
Totals	—			1,557,810	0	0	—			3,130,118	0	0

Difference in favor of 1902 3, £1,372,308.

It will be seen that in 1902-3 the gross values of these five lines of produce exceed by over one and a half millions sterling, or over 100 per cent, the gross values in 1896-7 than which a more striking parallel as to weather conditions and general prices could not well be found The question of the acreage from which these results were obtained may, of course, be raised. Here however the differences are so slight as to affect but little our general conclusions In fact, the slightly higher acreage in 1902-3 under these crops—2,152 183 acres, as against 2,093 418 in 1896-7—can be looked upon as confirming the well-known fact that improvement in general farming methods has rendered possible the utilization of land that had in the past been looked upon as valueless. It is, however, easy to take into account these slight differences in total acreages by calculating the gross average return per acre in each season. This average gross return per acre from the five lines of produce under consideration was represented in 1902-3 by £1 9/1, and in 1896-7 by 14/10½. These results confirm conclusions that might be derived from Table VII.

It is perhaps difficult to adequately describe the improvements in general farm practice, of which last season's results are the satisfactory fruits. Generally speaking, they are represented by more thorough and earlier soil tillage, the wider adoption of bare fallow before cereals, the more extended use of live stock on the farm, and the almost universal application of phosphates to lands characteristically poor in phosphoric acid. These improvements were strenuously advocated by Professor Lowrie during the latter years of his engagement here, and it is largely to the confidence reposed in him by the farming community that we see to-day their wide and intelligent application. Such facts, except in their results, do not generally admit of numerical representation. Nevertheless, it is interesting to note that whilst in 1896-7 the area in fallow was represented by 512,561 acres, in 1902-3 it had risen to 888,[illegible]46 acres. The improvement in the treatment of the fallows, which is of equal importance, does not admit of measurement. The Inspector of Fertilisers also informs me that, whilst in 1896-7 probably 1,200 tons of superphosphates were used over 30,000 acres, in 1902-3 over 37,500 tons were used on nearly 1,000,000 acres of land.

It may be conceded, therefore, that the superiority of 1902-3 gross returns over those of a season otherwise almost parallel can be attributed to the general progress in farm practices that has characterized the last few seasons.

THE CURRANT INDUSTRY.

Currant growers have not as yet to look for an outside market; it will, in fact, be many years ere we succeed in supplying even the Commonwealth's requirements. The annual imports of currants into the Commonwealth may be represented roughly by 5,000 tons, whilst the local production of Victoria and South Australia is represented by less than 500 tons. If we admit that the Commonwealth, with its rising population, is in a position to absorb 6,000 tons annually, and assume that the average yield of currants is not likely to exceed ½ ton per acre, even an area of 12,000 acres under Zante currants would not unduly congest the local market. I have been unable to ascertain the area under currants in Victoria; but, from enquiries made locally, I am able to classify currant vineyards in South Australia, as follows:—

	Acres.
Reynella and McLaren Vale	244
Clare and Auburn	220
Angaston and Tanunda	286
Gawler River	5
Yorke's Peninsula	7
Renmark	15
Langhorne's Creek, &c.	20
Total	797

We are far yet from the possible 12,000 acres, even admitting that Victoria can show 1,000 acres under currants, which I think unlikely. Currant growing can be confidently recommended to those who have taste for the kind of work it involves. I know of no more profitable method of utilizing good land.

EXPERIMENTAL WORK IN CONNECTION WITH THE AGRICULTURAL INDUSTRIES.

The complete dependence of the community on a prosperous and well-conducted agriculture, and our comparative ignorance of the nature and extent of the modifying influences exercised by local conditions on primary principles underlying it, that have been more or less accurately established elsewhere, must form the sole excuse for a somewhat lengthy consideration of the question. Our occupancy of the soil is but a thing of yesterday; to its agricultural exploitation we have brought much energy and the traditions of other lands; but, with the ill-suppressed cry in our ears that we are already short of available land, who can doubt but that we are yet very far from perfect utilization of the millions of acres that we nominally occupy? History teaches us that at all times progress in agriculture has been slow; unaided, it is in the nature of things that this should be so: and if it is by the rate that has obtained elsewhere that our future progress is to be gauged, many centuries may elapse before we can catch a glimmer of what constitutes the perfect utilization of our land. I am well aware that economic conditions that surround the modern world are such—the interdependence of the different States is so great—that events acquire a greater momentum in the twentieth century than in earlier days; but not least amongst the factors tending to accelerate the pace of progress is experimental research into the various principles that underlie daily practice. And if we wish to escape the long and painful groping through the darkness of empiricism, which in earlier times may have been possible with moderate comfort—or it may even be said nowadays, if we wish to avoid economic annihilation—we cannot afford to neglect what our rivals are not slow to take advantage of. Working in a country in which the failures of centuries have crystallized out into a moderately perfect system of agriculture, it may have been possible for Sir J. B. Lawes to state in one of the first of his memorable memoirs that it was not so much his object to introduce innovations as to discover the principles that underlay the practice of the most successful agriculturists, and thus make available to the multitude what must otherwise continue the possession of the few. With us, amidst our comparatively virgin conditions, experimental research must assume an even more important role than the celebrated English agronomist was disposed to allow it in a land that had in the course of centuries learnt, by bitter experience, what was profitable and what unprofitable practice. It is not only called upon to show the rationale of the practice of those amongst us who are comparatively successful; but, by a study of our own peculiar conditions, it should reduce to a minimum aimless halting after improvement, and unerringly point the way of future progress. I have the conviction that to the extent that we are prepared to foster research work in agriculture, to that extent will our progress in this line be gauged; and on its behalf, therefore, I make as strong an appeal as is in me to make.

I deem it advisable here to attempt to clear up certain misconceptions that appear to me to have gathered in our midst around this question. Since the middle of last century experimental research into agricultural questions has over the greater part of the world received considerable attention, and it certainly has not remained without re-echoes in South Australia. Off and on we have heard advocates of experimental work in our midst, and it is with all due deference to the opinions of others that I respectfully submit that too frequently it has been but a name that has been unfurled, whilst the spirit and essence of it have been overlooked. Not a few, for instance, confusing demonstration plots and their occasionally wonderful spectacular effects with the true experimental work that should always precede them, have advocated their dissemination over the length and breadth of the land. With all due respect I submit that, to establish demonstration plots without having first made provision for the experimental work of which they should represent the material results, amounts to placing the cart before the horse. I do not wish to depreciate the value of demonstration plots; they constitute the medium through which what has been acquired in the course of patient research can be popularized. It is obvious, however, that we must acquire first, and popularize or demonstrate afterwards.

In the course of this report I have already had occasion to advert to certain indications of evident progress that have during latter years characterized our agricultural operations. The fact that we have in the past been afforded but little opportunity for conducting real research work must remove all sting from the statement that the facts that have led to what progress has been achieved have resulted from a happy but purely fortuitous combination of circumstances, or been divined by the intuition of genius. At this juncture it remains for us to decide whether the fate of our future progress is to be left to the good offices of chance, or whether we are prepared to take matters in hand and shape our own destinies.

I am, of course, aware that there are many who are of opinion that enough of this work has not been done in the past at the Roseworthy Agricultural College, and who would willingly throw on this institution the whole burden of the work of the future. I fear much that those entertaining such views either overlook the fact that this institution is primarily a training ground for young men who in the future must earn their living from the land, or else they have but an inadequate idea of the lines on which such an institution should be conducted. The secret of the past success of the college as an educational institution lies principally in the special direction that has been given to the training. I have more or less intimate acquaintance with several similar institutions, both here and abroad, and I have no hesitation in stating that no more effective system of agricultural training has yet been devised than that which has obtained in the past at Roseworthy. The greater part of the land attached to the institution has been worked as a farm, on commercial lines, by the students themselves. What more thorough and convincing demonstration could be given them of what they may be expected to do when they take their own part in the struggle for life? So long as the College is worked on these lines there remains but little room for purely experimental work; not that I would deny that any work of this sort can or even has been done at this institution. This is very far from being the case; but I have had sufficient experience of educational institutions in which experimental work has completely swallowed up the training the latter are supposed to afford those attending them, to know that within certain limits the extension of experimental work can only take place at the expense of the teaching value of the institution.

The importance to the State of experimental work in connection with the rural industries is evident to anybody who has given any thought to the matter. That in the past but little, if anything, has been done here in this direction, and that whilst in the Agricultural Bureau system we have invaluable channels of dissemination and demonstration of what is established in the course of experimental research, we have not the means of carrying out any such work, must be equally evident. I propose, therefore, making certain suggestions with a view to remedying an anomalous situation and to giving effect to what concerns the immediate necessities of our only industry. It will be necessary to call into existence what, for want of a better name, we may term an "experiment station," in no wise hampered with direct teaching operations. At the outside a limited number of young men who had graduated at Roseworthy might be allowed, if they so desired it, to take up residence there with a view to following out the work that might be in hand. The station should be connected with an average block of land and provided with laboratories and all appliances necessary to such work. Any attempt to enter into the details of the work that could be undertaken by an institution of this kind would lead me beyond the limits of a general report. I must therefore content myself with the statement that it should embrace continuous research work into the conditions that surround all our rural industries with a view to discovering and indicating the most profitable lines along which our exploitation of the soil should be continued. Incidentally it would lead to the improvement of old methods now in use and the adoption of new ones, the economic fitness of which would have been discovered. Too much stress cannot be laid on the fact that not only should ample provision be made for the publication and dissemination of all information acquired, but it should be rendered imperative on the "experiment station" to keep complete record of its successes and failures alike, else, as has occasionally occurred elsewhere, it would degenerate into a purely ornamental show place. I have had occasion to refer to the memorable experimental work of Lawes and Gilbert; but of what value would be to-day or hereafter their 60 years of labour were it not for the careful and minute record of all facts connected therewith, which throughout all time will stand out as a monument to their industry and a beacon to those who are able to follow in their footsteps? A record of work done is not only called for in the interests of those who should benefit by the existence of such an institution, but it would serve as a guarantee to the public that the latter was justifying its existence. The establishment and maintenance of such an institution cannot take place without the expenditure of a certain amount of public money. I make bold to assert that in no other direction is such expenditure more needed, and in no other direction can an equal return await it. I am far from advocating lavish outlay from the outset. Let the institution be started first; let the lines of work be laid down, and as occasion arises, and the institution justifies its worth by the work it accomplishes, funds will be found to meet the requirements of the moment. To attempt to indicate the direction in which free and voluntary gifts should flow may perhaps savour somewhat of impertinence; nevertheless, in a country in which the wealthy owe their wealth, in most cases, to more or less direct connection with the soil, is it not surprising that whilst universities, hospitals, and kindred institutions have been most generously endowed from private sources, agriculture, the mother and supporter of them all, has alone been overlooked? It is but rarely that arise men like the late Sir J. B. Lawes, possessed of both the means and the inclination to follow out personally purely research work in agriculture. Has not, however, agriculture a right to expect that in the generous distribution of superfluous wealth her claims upon those she has helped to enrich will no longer be ignored?

As a first step towards the foundation of an "experiment station"—a step which, in my humble opinion, should be taken without delay—I would suggest the acquirement of a suitable block of land and the appointment to the department of a chemist, who would take charge of the chemical branch of the work. It may positively be asserted that, without the aid of a chemist, no experimental work of any value can be attempted; witness the action of Sir J. B. Lawes in associating with himself, in life-long collaboration, Dr. Gilbert; witness the numerous experiment stations in Europe and America. And here it might be well to clear up a misconception that appears to be general in this country in reference to the work of an agricultural chemist. His time is generally conceived to be exclusively occupied in the examination and analysis of soils, manures, waters, and agricultural products generally that may be submitted to him. I would state that whilst the chemist attached to the station might occasionally undertake such work, should time allow, his main occupation would be the supervision and interpretation of the chemical aspects of questions that might form the object of experimental work. And I might be allowed to add that it is the fact that this, the essential work of an agricultural chemist, has been generally overlooked in the other States; that although I believe we stand alone amongst the States of the Commonwealth without a departmental chemist, yet in the matter of experimental work our neighbours can boast of no better record than ourselves.

Although, perhaps, to a greater extent than any of the sister States, our prosperity is tied up with the prosperity of our rural industries, yet, neither in proportion to our territory nor to that of our population, is the annual Parliamentary grant voted towards their advancement in South Australia, when compared with what fulfils a similar purpose in the neighbouring States. The figures below, collected from the latest official sources, indicate what is annually devoted towards the advancement of agriculture here and in the other States. These figures do not include what has been spent upon the export of produce, forests, botanic gardens, and other special lines, such as £30,000 voted for rabbit-proof fences in Western Australia:—

New South Wales	£84,641
Victoria (exclusive of revenue from endowment lands set aside for the support of Agricultural Colleges)	33,504
Queensland	31,548
Western Australia	16,187
South Australia	9,965
Tasmania	3,800

I have no wish either to justify or criticise expenditure that obtains elsewhere; nor even to urge that it is our duty to keep up to the level that others have found it expedient to adopt. I might, perhaps, be excused the observation that this comparatively large expenditure of money would have been productive of better and more permanent results had a greater portion of it been allowed to take the direction of experimental and research work, instead of being absorbed almost entirely in show demonstration work—the value of which is always ephemeral, and ferquently more than questionable. If I have at all referred to what is done around us, it has been solely with a view to showing that we have been far from extravagant in the past, and that the creation of an experiment station would not unduly inflate our usual Parliamentary grant. It may be added that the £9,965 that we are at present allowed by no means represents the net cost of the Department to the State. From it should be deducted some £4,000 of revenue earned in various manners by the Department. Were a sum equivalent to this revenue set aside to cover the cost of purely experimental research work, I can undertake to guarantee that the people of the State would soon have reason to rest satisfied that every penny of the money would have been well spent. I again earnestly urge consideration for this most important question.

DEPARTMENT OF AGRICULTURE.

REMOVAL OF OFFICES.

The Offices of the Department of Agriculture are now situated in the Western Wing of the Jubilee Exhibition Building, North Terrace, Adelaide.

Members of the Agricultural Bureau are invited when in town to call at the Office. The Library of Agricultural Literature possessed by the Department can be consulted by anyone desirous of doing so during ordinary office hours.

DEPARTMENTAL NOTES AND WORK.

The meetings of several of the Branches of the Bureau last month were taken up by reports from delegates to the Annual Congress. As a full report of the Congress appeared in the October issue, and our funds are limited, it has been considered unnecessary to publish reports of this character unless there has been criticism or discussion on the papers read.

Through the courtesy of the Hon the Premier of Queensland, the services of Mr. Wilmot C. Quinnell M.R.C.V.S., Government Veterinary Inspector in that State, were placed at the disposal of this Department in connection with the swine fever outbreak in the South-East Mr. Quinnell, in company with the Chief Inspector of Stock and the local inspector, spent over a week in the district, and after careful examination confirmed the diagnosis of the local authorities We are pleased to be able to say that the outbreak appears to be now well within control.

A few months ago a number of parcels of roses sent from South Australia to Tasmania were refused admittance, and on enquiry from the Department of Agriculture we learned that the introduction of fruit trees, roses, and similar classes of plants into Tasmania, except from Victoria, was absolutely prohibited. As South Australia is unquestionably freer from serious plant pests than any other State of the Commonwealth, our growers felt that they had just ground for complaint against the Island State for shutting out our plants. The Hon. Minister of Agriculture for Tasmania was communicated with, and we have now been advised that, after fully considering the matter, he has decided to give South Australian nurserymen the same facilities as given to Victoria in this matter.

The Secretary of the Royal Agricultural and Horticultural Society intimates that the committee proposes to offer prizes at the March Show for samples of wheat exhibited by Branches of the Agricultural Bureau. Mr Alick J. Murray, of Mount Crawford, has offered a £10 10/ cup as first prize, and conditions of exhibits will be arranged shortly. This is a move in the right direction, and we hope that the members of the Bureau will heartily support the committee in its action. A good collection of wheat at the Adelaide Show would not only be of great interest to visitors, but would also be the means of bringing the Bureau and its work prominently before the public.

During the past month we have had a visitor from the Sydney Naval Stores enquiring into the possibility of using South Australian olive oil for the Australasian fleet The Admiralty uses a good many thousands of gallons annually in Australasia, and all of it is imported from southern Europe, but there is a natural desire to purchase from within the Empire if it can be done, not only from patriotic motives, but also with a view to developing local sources of supply of an article absolutely necessary to the efficient working of the fleet. South Australia can, and does, produce as fine olive oil as any country in the world, and there is a ready market for it in Australia. The price of this oil, and the quality also, is too high for what is required for naval purposes, but the fact that there is a large and certain market for a cruder oil at a fair price should offer every encouragement to our producers to plant more largely of olives. In addition to this we have all Australia as a market for our oil, and as we cannot at present meet all demands, there should be considerabl development in the oil industry in the near future. Last year's statistics show a production of 12,422 gallons of olive oil, and an export of 6,888 gallons, both figures showing a marked advance compared to the returns of a few years since.

On October 6 the Inspector of Fertilisers attended the Conference of Hills Branches at Cherry Gardens, and on October 14 paid a visit to Mr. A. L. McEwin's farm, near Anama, for the purpose of seeing the results of the application of heavy dressings of muriate of potash and sulphate of potash on wheat land. These experiments are being carried out under the supervision of the Department, and a report of the returns will appear in The Journal at a later date. At present it is sufficient to say that the application of potash does not promise to be remunerative in this particular instance. Where applied together with superphosphates the crops look a little better than where super. only has been applied, but the plots receiving potash only are very inferior to either of the other plots.

Besides attending to his usual work in connection with this office Mr. Quinn has continued to lecture and demonstrate in fruit culture at the Agricultural College at Roseworthy and the School of Mines at Adelaide. At the first named place he has continued to supervise the planting and work in connection with the vegetable and ornamental gardens. Mr. Quinn also attended the Conference of the Hills Branches of the Agricultural Bureau held at Cherry Gardens

During the month ending October 25, 11,051 bushels of fruit have been imported into South Australia. Of these 10,604 bushels were made up of bananas. Out of these 249 crates, equal to 498 bushels, were destroyed owing to actually containing, or being suspected of containing, the maggots of fruit fly. No ripe bananas are admitted to the State now on account of this insect, and any landed here are destroyed by being chopped up, dressed with carbolic acid, and afterwards buried beneath the tidal rise in an adjoining swamp at Port Adelaide. Within the same period 41 packages of trees and plants were admitted, and 8 detained because the usual declaration respecting the absence of phylloxera from the garden whence they were grown did not accompany them.

Of the 5,543 bushels of fruit exported, 2,384 consisted of oranges, 1,021 of lemons, and 1,002 of bananas re-exported, the remainder being made up of 10 different kinds of locally raised fruits. Vegetables to the extent of 2,334 packages, or over 250 tons, were sent away to Broken Hill, and 68 parcels of growing plants were forwarded to interstate destinations, accompanied by the certificates of the inspectors under the Vine, Fruit, and Vegetable Protection Act. Inspectors Brown and Rowell have been fully employed in attending to this work

The third session of the Agricultural College year has begun with 51 names enrolled. Two students left at the close of the second session, and the name of one student has been enrolled in the first year class for the regular course. During the month the Principal has attended meetings of the Agricultural Bureau at Narracoorte, Bordertown, and Lyndoch, and Agricultural Shows at Balaklava, Clare, and Tarlee, acting as judge for grain, cattle, and draught horses respectively.

Mr. Thomson (Dairy Instructor) visited the South-East during the past month, and addressed a meeting at Narracoorte. At Penola, Mount Gambier and Millicent he gave cheesemaking demonstrations, and inspected all the dairy factories. Experimental plots of grasses and clovers conducted by the Department at Mount Gambier were found to look very promising, and a small area under Newmarket oats showed a healthy appearance. Weekly shipments of butter are leaving the Government Depot for home markets, and the usual examination is conducted by the Dairy Instructor, who sends reports with suggestions to the factories shipping. Lectures on dairying at the Agricultural College are given as usual every Monday, and will be continued throughout the session.

In the Government Gazette of Thursday, October 29, His Excellency the Governor proclaimed the following weeds, viz.—Wild cotton (Gomphocarpus fruticosus), false caper (Euphorbia lathyris), and Cape tulip (Homeria collina) to be noxious weeds. So far as we know the wild cotton is mainly confined to the gullies and hills around Waterfall Gully; the false caper to the sandy soils near the eastern shores of St. Vincent's Gulf, but the Cape tulip has spread over a considerable area of country. The last named weed was illustrated in the September issue, but another species, with a single, upright leaf, and large, bright, orange-red flowers, is also plentiful in various districts south of Adelaide. It is proposed to publish coloured illustrations of the other two plants when we can secure suitable specimens for the purpose.

THE FERTILISERS ACT.

During October an Amending Fertilisers Bill passed both Houses of Parliament, and having been assented to by His Excellency the Governor has now become law. Beyond formal clauses the Bill only contains three short sections which the past three years' work has shown to be necessary

Some doubts arose last year whether guano came within the definition of 'fertiliser" given in the Fertilisers Act. A short clause in the Amending Bill makes the word fertiliser to include every article for use as a fertiliser of the soil, except farmyard or stable manure, crude nightsoil, crude offal, seaweed, or such other materials as the Governor may from time to time exempt from the operation of the Act This will remove any doubt on the subject.

The second—a most important section—deals with the sale of adulterated or inferior fertilisers Section 10 of the Fertilisers Act makes it an offence for any dealer to "sell, or exhibit, or offer for sale" any fertiliser deficient in the guaranteed constituents Practically every farmer believed that if the inspector found any dealer with bags containing fertilisers that did not come up to the guarantee the Department would be able to prosecute the offenders. Last year three cases of this character arose, and when the necessary instructions were sent to the Crown Law Department we were advised that we could only succeed in any action if we had evidence that the bags which were sampled were "sold, exhibited for sale, or offered for sale." Although we knew that the manure was actually sold, we could not produce evidence to prove it, consequently no further action was taken by the Department. As the whole tenor of the Fertilisers Act showed that Parliament recognised that it was impossible for the ordinary purchaser of manure to adequately protect himself against fraud, the Department asked that it should be made an offence for any dealer to have in his possession or control any registered brand of fertiliser that was deficient in its constituents beyond the margin allowed by the Act. This margin is equivalent to a value of 7/ per ton, and should be ample to enable the manufacturer to avoid any risk of prosecution by the Department for fraud. In the Amending Bill full effect is given to the request of the Department.

The third new section makes it necessary for all retailers of fertilisers to follow the guarantee of the importer or manufacturer who registers the guarantee of any particular brand.

AN OPENING FOR DRIED VEGETABLES.

Under the heading of "Openings for British Trade" The Board of Trade Journal for September publishes details concerning recent contracts of the Board of Admiralty for the purchase of dried or evaporated vegetables, which we reproduce in full below. With hundreds of tons of potatoes and onions going to waste in our south-eastern districts during the past season, it is manifest that "evaporating" or "drying" might with advantage be had recourse to with a view to absorbing inevitable surpluses and regulating local prices. It appears certain that a local company could be profitably brought into existence for that purpose in the neighbourhood of Mount Gambier. Perhaps, too, the new settlements on the Murray might find here an outlet for some of the exuberant produce of their rich irrigated lands. The industry is not new to South Australia, as for several years past Mr. F. A. Pulleine and others have successfully demonstrated its advantages to the producer.

In connection with the revised scale of victualling which will come into force in His Majesty's Navy on October 1, the Board of Admiralty directs attention to the fact that the decision to include preserved vegetables in the scale has already rendered large purchases of these goods necessary, and that it is anticipated that supplies of similar magnitude will be required annually for the future. The board points out that of 18 firms noted for the supply of these articles only one possesses a factory in the United Kingdom, the remainder being Canadian, French, German, or Dutch, and they state the following as being among the reasons which have been adduced for the comparative failure to establish an industry in preserving vegetables in this country:

(a) The great demand for fresh vegetables, and consequent high prices;

(b) The excess of moisture in vegetables grown in this country, rendering them unsuitable for drying; and

(c) The high rate of wages prevailing in the United Kingdom.

The following are the conditions of contract for recent supplies:—

1. Quality, Specification, &c.—The vegetables to be supplied under the contract shall be answerable in every respect to the following specification, and shall be in all respects equal to the samples accepted:—

The vegetables shall be preserved by drying, desiccating, or evaporating, and shall be equal in all respects to the approved samples.

They shall be of the latest growth and best quality, carefully cleaned and well preserved shall be free from adulteration and from all chemical preservatives, colouring matter, or metallic impurities.

They shall not contain more than 12 per cent. of moisture.

The vegetables consist of the following descriptions:—

Potatoes in slices.
Haricot Beans.
Beans, shredded or whole.
Onions.
Carrots, shredded.
Cabbage.
Spinach.
Mixed vegetables.

The five latter descriptions shall be compressed. The mixed vegetables shall consist of—Potato, 50 per cent.; onion, 25 per cent.; carrot, 25 per cent.; well blended.

They shall be packed in 1-lb., 2-lb., 5-lb., and 10-lb. tins, hermetically sealed

The tins shall be painted or lacquered, so that the paint or lacquer will not easily rub off or chip.

The tins shall be packed in strong export cases, each containing 25 lb. or 50 lb. net, in the following proportions, viz.:—25-lb. case consisting of one 10-lb., one 5-lb., four 2-lb., and two 1-lb. tins; 50-lb. case consisting of two 10-lb., two 5-lb., eight 2-lb., and four 1-lb. tins. Each tin shall bear a label giving the quantity and description of the contents, and clear instructions as to the best method of cooking.

The date and year of preparation to be marked on the side of each case, together with the name of the contractors. No other marks or labels will be allowed. This does not exclude any private mark for contractor's own guidance.

2. Warranty.—The goods shall be warranted to keep fit for use and in good condition on board ship, and in any climate, for a period of two years from the date of delivery into store, and all condemned within that period shall be replaced by the contractors free of charge.

The following shows the quantities of preserved vegetables procured by recent tenders:—

Potatoes in slices	in 25-℔. cases	12,350 ℔.
Potatoes in slices	in 50-℔. cases	37,150 ℔.
Beans, shredded or whole	in 25-℔. cases	8,250 ℔
Beans, shredded or whole	in 50-℔. cases	24,750 ℔.
Haricot beans	in 25-℔. cases	2,050 ℔.
Haricot beans	in 50-℔. cases	6,200 ℔.
Compressed mixed vegetables	in 25-℔. cases	4,100 ℔.
Compressed mixed vegetables	in 50-℔. cases	12,400 ℔.
Compressed cabbage, dark green curly	in 25-℔. cases	9,100 ℔.
Compressed cabbage, dark green curly	in 50-℔. cases	27,400 ℔.
Compressed carrots, shredded	in 25-℔. cases	4,100 ℔.
Compressed carrots, shredded	in 50-℔. cases	12,400 ℔.
Compressed spinach	in 25-℔. cases	9,000 ℔.
Compressed spinach	in 50-℔. cases	26,900 ℔.
Compressed onions	in 25-℔. cases	2,050 ℔.
Compressed onions	in 50-℔. cases	6,200 ℔.

OIDIUM AND SULPHURING.

By Arthur J. Perkins, Secretary for Agriculture.

There are many practices that a series of unusually dry seasons have put somewhat out of fashion, and with the return of normal weather it is possible that we may not appraise at their true value the lessons we had learnt many years back. It might be argued with equal justification that umbrellas are now a thing of the past in South Australia, as to omit some of the precautions that experience has shown to be essential to the successful development of our crops. The practice of sulphuring against oidium has in many districts become almost a forgotten art, and in face of weather conditions unusually favourable to the development of the parasite a few words as to the best means of keeping it in check should not prove out of place.

The fact that of late years evidences of the presence of the disease may not have been apparent to the casual observer should not lead us to infer that the drought has succeeded in stamping it out. The oidium parasite, just as much as the red rust fungus in the wheatfield, is present in every vineyard to-day, awaiting favourable opportunities to spread over our vines. There is no year, however dry, in which it does not find some means of completing its cycle of vegetation and of leaving behind it spores ready to take advantage of more favourable seasons. The difference between the dry and the moist season lies simply in the fact that in the former the damage done is insignificant, and passes unnoticed, whilst in the latter the value of the crop may be endangered.

The conditions that favour the development of oidium consist in a suitable combination of moisture and heat. In heat, even in the earlier part of the season, it is impossible to imagine that we should ever be lacking; moisture, on the other hand, is frequently not sufficiently abundant to result ultimately in much damage to our crops. Thus far the present spring has been unusually favoured by frequent showers; and the temperature, whilst probably below our normal mean for the time of the year, has not been sufficiently low to absolutely check the parasite in the early stages of its development. We may anticipate, therefore, during the present month, unless weather conditions prove unusually adverse, a fairly free development of oidium in most of our vine districts.

There are many in whose minds oidium is associated solely with the white greasy film that envelops the fruit as it approaches maturity. Undoubtedly it is at this stage that the damage done is most apparent; nevertheless, at an earlier date it is responsible for much that frequently escapes observation. The fungus attacks every green portion of the vine; that is, every portion enveloped by an outer layer of chlorophyl bearing cells— the wood in its early stages, the leaves, the tendrils, the flowers, and the fruit prior to "turning." It is with the flowers that we are mainly concerned in November. The oidium fungus may attack the latter as they open, and interfere materially with the setting of the fruit, and consequently with the chances of the crop. Vigilance during the present month cannot, therefore, be too strongly recommended.

Fortunately this disease, which at one time appeared to threaten the very existence of the vinegrowing industry in Europe, is easily dealt with. Sulphur, if properly applied is an infallible remedy, and no amount of more or less specious advertising should induce vinegrowers to substitute for it any new specific Unlike most other fungus parasites of plants, Erysiphe Tuckeri (the oidium fungus) is purely external; that is, it creeps on the surface of the tissues on which it preys, and is not embedded within them. It draws its sustenance from them by emitting small "haustoria," or suckers, which penetrate the surface cells and exhaust them of the materials they are elaborating for the benefit of the whole plant. If the film, which covers the affected parts, and which represents the vegetation and fruit-bearing organs of the parasite, be carefully rubbed off, beneath will be apparent a series of red spots, representing the points of insertion of the suckers. In the winter these spots darken, and are represented on the wood by black patches, or small spots the size of a pin's head, according as they coalesce, or remain in isolation The cells of the parasite are exceedingly delicate, and exposed and unprotected on the surface of leaves and wood they are easily disorganized by contact with the finely powdered sulphur, under the influence of high temperature. What is the exact action of sulphur in this respect appears still to be somewhat obscure. Some maintain that direct contact with the particles of sulphur is essential; others, without denying the action of contact, believe that the sun draws out equally effective sulphur fumes; others believe in slow oxidation and the formation of sulphur dioxide; others, again, in the possible formation of sulphuretted hydrogen. Perhaps all the actions here referred to come into play, and fortunately none of them need cause us to alter the practices that long experience has shown to be the best.

The more impalpable the sulphur dust the better. It is ultimately more effective, and in virtue of the greater surface it can be made to cover, it is more economical. The finest "flowers of sulphur" are obtained by a process of sublimation. Their use, however, cannot generally be recommended owing to a perceptible proportion of sulphuric acid, which is always present, and increases the dangers of ophthalmic troubles to those who are applying the "flowers" on a windy day. Ground sulphur, though never equally finely divided, can always be obtained suitable for the purpose. The sulphur should, however always be carefully examined prior to purchase, and on no account should a coarse powder be accepted. When, as is frequently the case, large areas have to be sulphured several times in the course of a season the cost of the material used becomes a matter of serious consideration. It may, therefore be noted here that when sulphur is used in the pure state, far more is placed on the vines than is actually necessary. If any less expensive material of equally fine texture is at hand it may with advantage be mixed half and half with the sulphur. This practice is particularly advantageous if the inert material is dark in colour, as would be the case with soot; it helps to absorb the heat rays, and renders more effective and rapid the action of the sulphur particles. It is hardly necessary to point out that such a mixture could not be relied upon unless the sulphur had been intimately and thoroughly mixed with the inert powder.

Connected with the success of sulphuring are several points that should always be borne in mind. It is essential, particularly in the early season, before the great summer heat reigns supreme, that every green portion of the plants be coated with a fine layer of sulphur. This result can only be secured by applying the sulphur on dry leaves. If the leaves are moist the powder gathers up in balls, and when the moisture evaporates, and the sun heat makes itself felt, much of the fungus escapes direct contact with the sulphur, and continues the invasion unmolested. Dry sulphur has no specially adhering properties, and, particularly if somewhat coarse, is apt to be blown away by the winds. It follows that it should only be applied when conditions favour its immediate action. Hence it behoves us to remember that unless the sun temperature is comparatively high it remains inert, and pending its use may be blown away before opportunities for action may have arisen. In this connection, therefore, in the spring days, if the weather is cold, sulphur should only be applied in the forenoon; what is applied in the latter half of the day may have to wait 24 or 48 hours, or longer, before entering upon a period of activity, and in the meanwhile it may have become scattered to the four corners of the earth. In a period of hot weather such a precaution is, of course, unnecessary. Later on, when the object is the protection of the fully formed fruit, difficulties of another order occasionally arise. The heat may be such as to induce "scalding" of the berries by direct contact with sulphur in the burning hours of the day. Here, again, but for another reason, early morning sulphuring is to be recommended. In the north of Africa, where similar climatic conditions obtain, but where bush vines alone are grown, it is customary to project the sulphur between the vines, so as to avoid direct contact with the fruit. It is maintained that in such conditions the great heat of the summer sun produces such a rapid evolution of sulphur fumes as to be generally effective against the parasite. I am inclined to doubt the efficacy of this practice for trellis vines; nor, in fact, have I ever had the opportunity of personally testing it, even for bush vines.

It should be remembered that in warm days the parasite flourishes best in the shaded portions of the vine. In fact, high sun temperature will destroy it or shoots that are exposed or in contact with the soil. The plants should therefore be carefully opened out and sulphured with particular care in those portions that the sun cannot reach.

It is very generally the practice here to apply the sulphur by means of a small bag, of open texture, which is simply shaked over the vines. The practice has, no doubt, rapidity of action to recommend it, but I must raise a protest against it, as being both wasteful and dangerous, besides being frequently ineffective. It is wasteful, because it involves the use of twice or three times as much sulphur as is actually required; it is dangerous, because it compels the workman to do his work in a cloud of sulphur, much to the detriment of his eyesight. It is ineffective, because, whilst prodigally wasting sulphur in places, it frequently misses those portions that are most in need of it. Special sulphuring bellows are made for the purpose, but I much prefer the knapsacks, by means of which the sulphur is, so to speak, sprayed on to the leaves in a fine dust. The sulphur knapsacks economise sulphur; they enable the workman to apply it evenly wherever required; and they enable him to keep out of the dust, so injurious to his eyesight

A warm day, with a slight wind, should be chosen for the operation, and the man sulphuring can thus work with the wind, and avoid inconvenience to himself. Should rain follow immediately, the operation must be repeated. Vines may be sulphured whilst in full bloom, without danger to the setting of the fruit. It has, in fact, been asserted that, if anything, the fumes are helpful to the proper consummation of this physiological act.

SPRING AND SUMMER PRUNING OF DECIDUOUS TREES.

By Geo. Quinn, Horticultural Instructor.

It is a well-known fact that any reduction of its foliage in spring or summer weakens a fruit tree in due proportion. When, however, only certain branches are defoliated, the weakening action is felt more particularly by those portions of the tree. Advantage is taken of this localizing influence of leaf reduction in the shaping of young trees. Every one who has trained a fruit tree will have noted inequalities in the growths of the shoots, which are destined to form the main arms. By restraining the extension of the stronger shoots for a necessary period the weaker ones may be enabled to lengthen and raise their growing tips to an altitude equal to that gained by the others. The unvarying law which causes a stronger flow of sap to the higher points of growth will then operate with greater equality to all of the shoots, and more even advancement may be generally obtained.

In practice this operation consists of pinching out the sappy tip of the strong shoots on the young tree when they have attained a length of about eight inches or more. This is illustrated in Plate 1. If, as is sometimes the case with young apple trees, the topmost bud or two alone starts into growth, this operation may be performed before these shoots gain even the length suggested above. By this means the dormant buds are often excited into activity, and the desired number of main shoots secured. At the same time, a crescent shaped notch cut crosswise above each obstinate bud will assist in securing the desired result. (See Plate 2.).

Sometimes, on the contrary, the buds all along the stem of the young tree will start into growth, and it is necessary to restrain some of these. After selecting those most suitably situated for forming the main arms of the future tree—and consecutive shoots should be avoided, if possible, for this purpose—the others remaining should not be rubbed off completely, but their points should be pinched off from time to time to subordinate them. The leafage upon these lower twigs will shade the tree stem, and assist in the vegetative functions of the tree. The lower twigs on the stem of the tree in Plate 1 have been treated in this way. In the case of an accident to one of the main shoots one of these stunted shoots may prove useful for replacing it, and thus retain the balance of the main limbs around the stem. It is often necessary to continue to regulate the development of the leading shoots in this manner for several seasons, before a well-balanced head is secured.

Plate 1. Young Plum Tree, with tip of strongest shoot pinched out to throw the sap into the lower leaders. The shoots on the stem not required as leaders have also been pinched back.

When grown under very favourable conditions the young apricot trees will sometimes require further manipulation during the season of active vegetation. The growth upon these trees will often ascend so rapidly that the

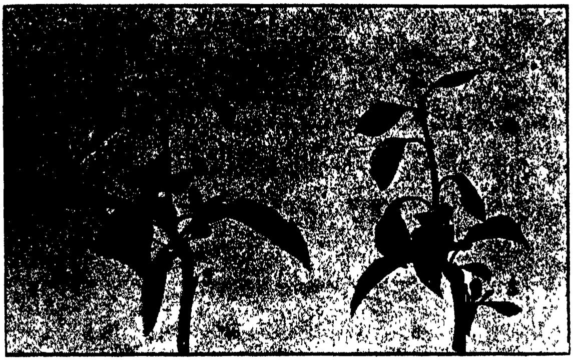

Fig. 1. Fig. 2.

Plate 2.—Young Apple Tree. Fig. 1 was topped at "P" to start dormant bud Fig. 2 shows the bud started into growth.

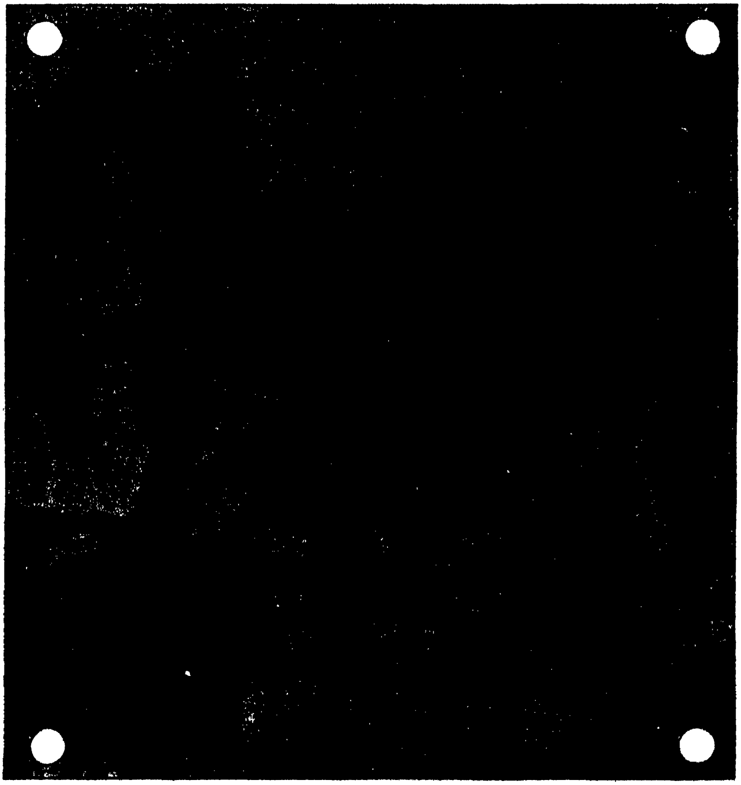

Plate 3.—Typical growth on Peach Branch. Shoots marked "S" only crowd the others, and should be removed. See Plate 4.

rigidity of the branches is unequal to the weight they are called upon to support, consequently breakage or contortion takes place. Where these young leaders have reached a height of 2½ ft. to 3 ft., and are still growing vigorously, it is advisable to cut them back to about one-half their length, and allow them to make subdividing shoots during the same season. This operation is, however, only suggested to meet exceptional cases, when pinching has failed to stiffen the shoots, and is not recommended for general application.

During the first few seasons after the apricot and peach trees reach a fruit-bearing age they are usually flushed with vigour, which causes too many annual shoots to start into growth. These are all clad in foliage, the density of which soon shrouds the lower portions in deep shade. If permitted to remain, this crowded condition will result in weakly branches on the lower parts being made still weaker or being killed outright. Those remaining will not receive sufficient light and air to harden and mature the bark and wood on their lower extremities in time to form good wood and flower buds thereon.

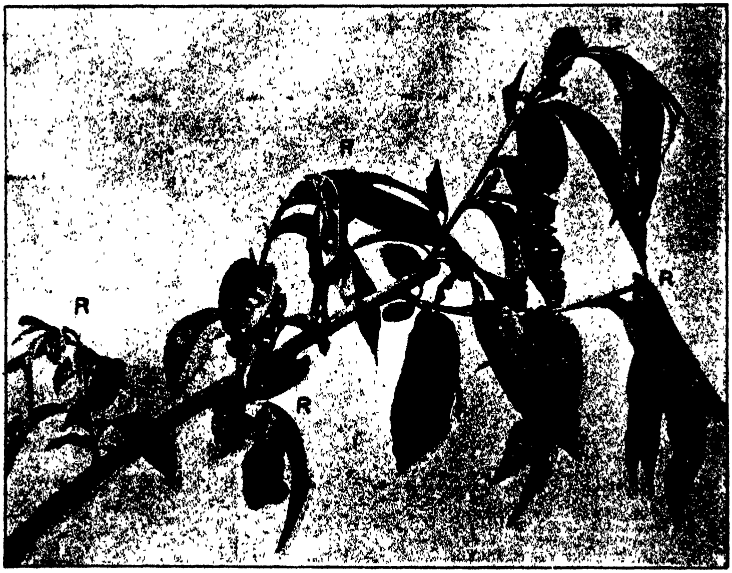

Plate 4.—Showing Peach Branch after removing surplus shoots.

To avoid this undesirable result it is necessary in the early summer to rub off completely all crowded shoots. Those remaining should be spaced, so that the light may pass very freely around each one, not only at the time of doing the disbudding, but when the shoot has increased in size (see Plates 3 and 4). This disbudding throws the energies of the tree into fewer shoots, and secures the greater uniformity in size and value of the fruit shoots the following winter.

On the peach tree the shoots left at the winter pruning for fruit bearing will require attention about the same time. Some of these will have set a fruit or fruits near to the extreme tip; between these and the base many shoots may have started out. A terminal shoot is necessary to draw the sap up to and past the fruit, and it may also be desirable to encourage young growth to come from near the base of the fruit-carrying shoot, so that no gap will be left when it has fulfilled its mission, and is removed at next winter's pruning. To secure this the young shoots upon the centre of the branch should be rubbed off, and the terminal shoot beyond the fruit pinched. The removal of these growths permits the light to reach the base buds, and the temporary check caused by pinching the terminal point throws the sap into them. Again, some of these shoots left for fruit bearing have set no peaches; these should be cut back to the base buds, or to where shoots arise near to the base. This prevents undue extension, and starts the replacing shoots, from or near to the parent branch (see Fig 2 in Plates 5 and 6). In other instances some of these winter pruned fruit shoots have set their fruits on the lower portion of their length, and in such cases they should be shortened back to where the outer peach is attached if a shoot accompanies such a fruit. If there is no wood shoot-arising from the point of attachment

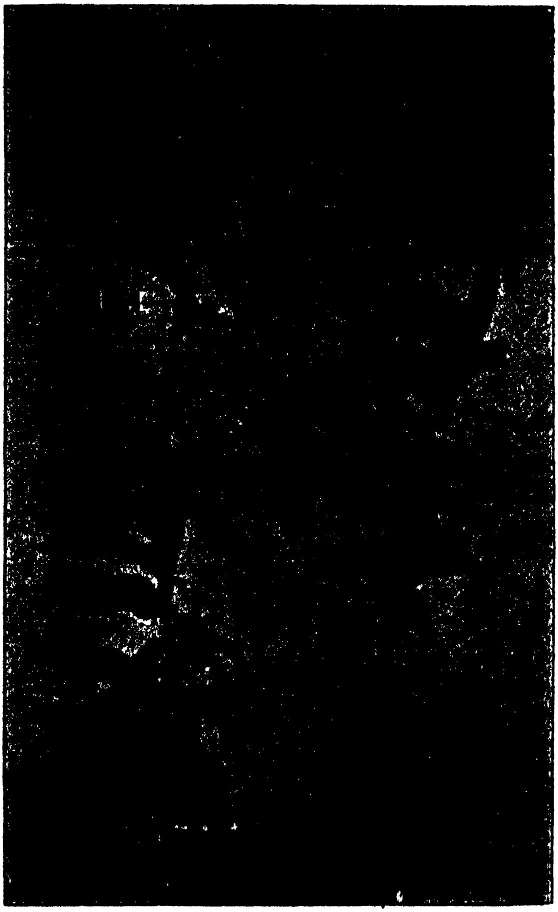

Fig. 1. Fig. 2.

Plate 5.—Typical fruit shoots of Peach. Fig. 1 bears fruits (P) on the lower portion only; Fig. 2 is quite barren.

then the old shoot should be reduced to where the first new growth is found beyond the topmost peach (see Fig 1 in Plates 5 and 6). This prevents undue extension, admits light to other buds, and simplifies the next winter pruning.

Very vigorous peach trees will require attention later in season. It will be found that, notwithstanding the above treatment, there is a tendency for many growths near to the summit of the leading branches—which on a tree of less vigour would be good fruit shoots—to compete with the leading wood shoots in strength. Some of these should be taken out completely in late summer—say early in March—so that sufficient sunlight may be admitted to ripen the wood, and cause the buds near the base of each shoot to develop

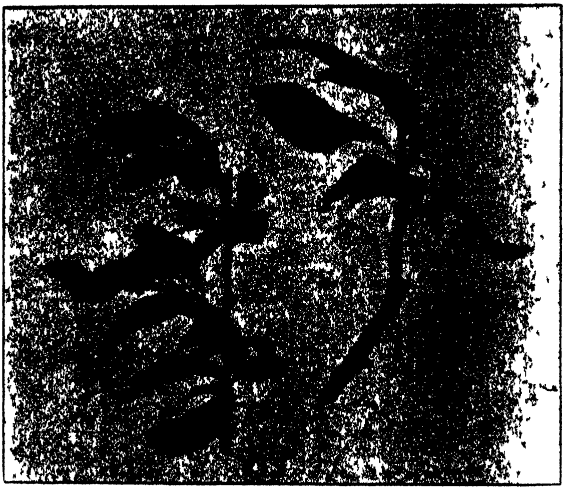

Fig. 1. Fig 2.

Plate 6.—Treatment suggested for shoots shown on Plate 5 in order to securing a renewal of the fruiting wood near the base of the shoot

(To be continued.)

APRICOT FRUIT PULP FOR EXPORT.

In reply to a correspondent who wrote for particulars respecting the pulping of apricots, and asking whether it was advisable to send the fresh fruits to the seaboard to be pulped, Mr. Quinn has supplied the following information, which might be of use to some of our growers.—

Owing to the comparatively inexpensive nature of the working plant required, and the damage the fresh fruit is liable to incur in transit to the sea board, it is advisable to process the apricots in the orchard. With the exceptions of Messrs. T. and W. Sage, of Siegersdorf and Angaston respectively, I know of no grower in this State who has taken up this business The initial efforts of these gentlemen were only moderately successful, owing, as Mr. W. Sage informs us, to the tins proving inferior, and because they failed to test each one prior to packing it for the voyage. The Messrs. Sage made their cooking vats from ordinary square sheet iron tanks, which were cut down to accommodate the tins in a standing position, while the sterilising process was going on. These tanks were built over a furnace constructed for the burning of wood as fuel. The tins sent out from London as samples of those used by Continental packers are round and cylindrical in shape. They measure 5¾ in. in diameter by 10 in. in depth, and their reputed holding capacity is about 10 lb. of pulp. The loose lids or studs should not be less than 3 in. in diameter. An opening of this size facilitates the filling and refilling when the partially cooked fruits subside. Ten of these tins are packed in a case, which has a strengthening partition across the middle.

The process of pulping followed in Victoria has been, with slight local modifications, as follows:—The fruits must be ripe, but not squashy, and the size is not so important a factor as the flavour and general quality. The pits are removed, and the halved fruits are packed into the tins—not thrown in anyhow—until the tin is completely filled. If the apricots are very firm a very little water is added, but if partly juicy this is not adopted. The tins are then stood either in a cage or on a false perforated bottom in the boiler, with water reaching within an inch or so of their tops. If a lid can be used over the boiler the sterilizing will be hastened and heat conserved. The water in the boiler is kept at a boiling point until the contents of the tins are partially cooked but sterilized throughout. If a thermometer is used, see that the contents of the tins are heated above 180 Fahr., and kept at that for some minutes. The fruit must not be reduced to a mush. As the cooking proceeds the contents of the tins subside considerably, and they must be refilled with similar fruits from some of the adjoining tins. When sufficiently cooked the tins are lifted out, and the lids soldered, leaving a stud hole only in each one. They are then replaced into the bath the temperature again raised to the abovenamed degree, at or above which they should be finally soldered down. The tins are then stood in a well-ventilated position to cool. In a week or ten days they should be tested individually by being submerged in hot water. If the tins are not perfectly air-tight, the air will escape through the leak, and the bubbles be detected These leaky tins should be retreated and soldered, and not sent as first-grade pulp. The chief points of importance are:—

(1). Good firm fruit—not rubbish.

(2). Stout, sound tins.

(3). Complete and careful filling of the tins.

(4). Careful sterilization—not over-cooking.

(5). Testing each tin of pulp prior to packing.

(6). Packing the tins securely in a strong case.

The market in London varies from season to season for fruit pulps. When the English and Continental fruit crops are good it won't pay our growers to pulp. The cable advices are distinctly promising this year, and good prices are likely to be obtained in London. As the cable usually advises us of the prospects of the European fruit crops sufficiently early to permit the necessary tins, &c., being obtained, pulping should be remunerative to those who watch the market closely. If carried on in conjunction with drying, it should be a valuable outlet for apricots grown upon cheap land, without the cost of irrigation. The grower of currants who already possesses a drying plant, trays, &c., and who has cheap land, should consider whether apricot growing could not be worked with the currants. The apricots, if dried, would be off the trays in time for the currants to occupy them. Although the cost of a pulping plant should not be high, it would also be worth while a number of growers, whose gardens are close together, considering whether they could not work on a co-operative principle in establishing a pulping plant. One of themselves, if experienced, could then superintend the work, or they could engage a competent man if a larger quantity were to be pulped.

According to advices received by the Victorian Department of Agriculture, the 10-lb. tin is the type preferred in London. A consignment of 63½ tons sent by the Goulburn Valley growers in 1901 cost £2 per ton for labour in pulping, tins cost 6¼d. each, cases 1/5 each, while freight, commissions, and other charges brought the costs to £13 per ton. The Goulburn Valley Association have received advises that, owing to the shortage in the English soft fruits, there will probably be a good market for apricot pulp at £23 to £25 per ton; at even £20 per ton it should pay our growers to test the market, more especially as the shipment of several hundred tons of pulp would steady the price locally and thus benefit the growers in an indirect way.

EXPORT OF APPLES.

Although apple trees are only just setting their fruits, growers who intend to ship their produce to London must at this early date make their arrangements for securing space in the steamers engaged in the trade, or be dependent upon those who speculate in freight, and buy apples to fill up the space secured. Taken altogether, last season's results were very encouraging, and with a reasonable reduction in freight and in the cost of fruit cases there should be an almost unlimited market for our fruit in England. With the high rates that have prevailed in the past, fruit has to be sold at such a price in London that it is beyond the reach of any but the wealthy classes. With a reduction of, say, 2/ to 2/6 per case in the total charges, it should be possible to sell our apples at a price which, while returning a profit to the grower, would place them within the reach of ten times the number of people who can buy at present rates.

Last year the mail companies charged 85/ per ton freight, to which 5/ per ton lighterage was added, making the total 90/, or, say, 3/11 per case, the Holt steamers, leaving the Port Adelaide wharf, charged 75/ per ton, equal to about 3/4 per case. This year the freight charges have been reduced somewhat, and, although, when compared with the rates at which frozen lambs and mutton are carried, growers have good ground for considering them still too high, the reduction will be none the less welcome. The P. & O. and the Orient-Pacific mail steamers offer freight at 77/6 per ton (less a rebate of 5/ per ton to be paid in May of each year) to shippers entering into a two year's contract to give these companies the first refusal of any fruit they may have to ship. Messrs. George Wills & Co., as agents for the Holt Blue Funnel line, offer freight at 70/ per ton, and for Lund's Blue Anchor line at 65/ per ton, without any stipulation in respect to shipping by other lines. This will reduce the freight charges to approximately 3/5 per case by the mail steamers, 3/1 per case by the Holt line, and 2/10 by the Lund line. The following are the dates of the advertised sailings of the respective steamers:—

February 18—Orient-Pacific line.
" 25—P. & O. line.
March 3—Orient-Pacific line.
" 3—Holt line
" 10—P. & O. line.
" 15—Lund line.
" 17—Orient-Pacific line.
" 23—Holt line.
" 24—P. & O. line.
March 31 Orient-Pacific line.
April 7 P. & O. line.
" 12—Lund line.
" 14 Orient-Pacific line.
" 15 Holt line.
" 21 P. & O. line.
" 28 Orient-Pacific line.
May 3—P. & O. line.

Applications for space must be made to the Orient-Pacific and P. & O. agents not later than November 25, 1903, and to the Holt and Lund agents before November 20.

ROSEWORTHY AGRICULTURAL COLLEGE NOTES.

FARM.

By J. D. Towar, Principal Agricultural College.

The past month has been an especially active one. The farm teams were kept busy working the fallows until the hay cutting, which began in real earnest on October 19, since which time three machines have been constantly at work. The shearing was finished early in the month. Owing to the large number of store sheep on hand at shearing time, we have more wool to sell this season than in the two previous seasons combined.

The Crops.—The first plots ready for the binder were the cross-drilled plots at the west end of the "Island." These were College selection, sown April 28-30, one-half cross-drilled with the same variety, and the other crossed with Defiance, a late variety. The College selection is an early variety, and these two plots began to show considerable red rust. The other seedings of this variety are showing but slight attacks of the rust, which promise in no way to affect the yield of grain. From the above plots the machines went to the Cape oats and the Calcutta oats and wheat, which were on October 19 in prime condition for hay. About 20 acres of the Calcutta oats were left to ripen, and be cut and threshed for grain. Leaving the later varieties—Newman's, Dart's Imperial, and Defiance the binders began on the King's in Flett's, about 60 acres of which will be cut for hay and the remainder left for grain. Red rust has appeared more or less in nearly all the varieties. A report of the extent to which the different wheats are affected will form a part of next month's notes

Live Stock.—Those who have seen the College animals frequently in past years say they have never looked better. The cattle and sheep are rolling fat; the breeding sows living on pasture only, are fit for the butcher's block, while the horses, though working hard every day, are in fine condition The feed the past winter has been of great variety, excellent quality, and abundant. The prospect of abundance for the ensuing months is also good, and with seedings of rape in the various fallows, now making a healthy growth, there is every hope of a continued supply of green feed for the sheep well into the summer. The silos are well filled with green barley and wheat, which we have every reason to believe will turn out fresh and appetizing for the cows when all other feed will have become parched and dry. Since writing the last notes two foals have been born, a pure-bred Jersey bull calf, a gift from Mr. S. S. Ralli, has been received, and a 2-tooth pure-bred Lincoln ram purchased from Mr. J. H. Angas. On October 14 we sold 43 mixed lambs in the Adelaide market, these being the season's culls. They averaged 12/7 per head. Ten Dorset-horns brought 16/7 each. The farm is completely sold out of Berkshire pigs, with orders booked ahead for 25 young ones

During the past month visits have been received from members and neighbours of the following Branches of the Agricultural Bureau: Reeves Plains, Golden Grove, Gawler River, Mallala, and Lyndoch: also from the Gawler Agricultural Society, and small parties from several places, making a total of about 150 visitors, who during the month inspected the institution, and have given it the encouragement of friendly criticism. This method of visiting the College is more satisfactory, both to College officials and visitors, than the general inspection day, when the people throng in hundreds. The season of the year is better for seeing the crops than early in September, and the staff and visitors each have more time to give attention to the other Visitors are always welcome, and there is no better way in which the influence of the College can be exerted than through the example of its fields, crops, and flocks.

EXPERIMENTAL VINEYARD.

BY H. E. LAFFER, SUPERINTENDENT OF VINEYARD.

Under the influence of the warm weather experienced during the last month the vines are making rapid growth The season has been exceptionally favourable to the starting of young vines, for, though the rainfall is below the average, frequent light showers have fallen to keep the soil moist. The total rainfall for the year up to date is under 14 inches; but, notwithstanding this, the growth on the vines is stronger than in previous years. This to a great extent is probably due to the manures used this season, coupled with the fact that, owing to the dry conditions prevailing last year, the growth was poor, and little of the manure applied was used. As far as can be judged at present, the crop will be a good one, provided no unforeseen catastrophe intervenes. Once or twice the temperature has gone to within a few degrees of frost.

Scarifying is now well in hand, and the land will shortly be worked down to its summer tilth, and free from weeds. All the young fruit trees planted are making good progress. A few of the peaches were attacked by black aphis, but a little tobacco wash quickly cleared off this pest. The work of laying the pipes in the orchard will be undertaken in a few days, and we shall then be able to give the trees some water.

In the wine cellars all necessary work has been attended to. A quantity of wine, consisting of over 2,000 gallons, has been shipped to London. This is our largest shipment so far, but in the future we should increase the quantity annually.

PIG-FEEDING EXPERIMENT AT AGRICULTURAL COLLEGE.

By J. D Towar, Principal Agricultural College.

Two lots of pigs, four in each lot, were selected for this test. To one lot wheat and pollard, with all the water they could consume, was given; and to the other lot molasses, added to the wheat and pollard, was given. The test began July 12, after a preliminary feeding of one week, and continued for six weeks.

The molasses-fed pigs, including two sows and two barrows, weighed 171 lb. on July 12, and gained 235 lb. in the six weeks. The other lot, consisting of three sows and one barrow, weighed 153 lb. on July 12, and gained 201 lb. in the six weeks. The first lot consumed 204 lb. of wheat, 206 lb. of pollard, and 171 lb. of molasses, while the others ate 240 lb. of wheat and 210 lb. of pollard. Taking the present prices of wheat, pollard, and molasses as follows wheat, 5/ for 60 lb.; pollard, 1/ for 20 lb.: and molasses, 5/ per cwt the financial statement of this experiment would be somewhat like this:

LOT I.

Weight at close of experiment, 406 lb.; original weight, 171 lb.; credit by gain in six weeks, 235 lb., at 4½d.—£4 8/1½. Dr. to feed—204 lb. wheat, 17/; 206 lb. pollard, 10/3-6; 171 lb. molasses, 7/7-5—£1 14/11; net gain, £2 13/2½.

LOT II.

Weight at close of experiment, 354 lb.; original weight, 153 lb.; credit by gain in six weeks, 201 lb., at 4½d. £3 15/4½. Dr. to feed—240 lb. wheat, £1; 210 lb. pollard 10/6—£1 10/6; net gain, £2 4/10½. Profit in favour of molasses, 8/4.

Briefly stated, 171 lb. of molasses, costing 7/7-5, gave an actual profit of 8/4 in six weeks, when fed to young pigs in conjunction with wheat and pollard. It lessened the quantity of wheat and pollard consumed, and it materially increased the growth.

The reader, however, must not jump to a conclusion from the results of this single experiment, for the circumstances generally were in favour of the molasses. With wheat and pollard reduced in price the proportionate profit on the molasses investment will decrease. The feeding of molasses involves more work. If fed in the summer season it invites flies, while as a winter feed it is somewhat heating. The experiment, however, indicates a decided advantage from the addition of molasses. Further experiments will be conducted with molasses as a feed as soon as another crop is harvested and a greater variety of feed is obtainable.

NOTES FOR FACTORY MANAGERS.

By G. S. Thomson, F.R.S.E, Government Dairy Instructor.

During a visit to a number of factories last month I made enquiries as to the course of manufacture of the best-keeping and highest-flavoured cheese. Managers informed me that their slowest curds, occupying in making over four hours, produced a vastly superior product. I would strongly urge a discontinuation of rushing the working process, and giving longer time for cooking in all cases where sound milk is being handled. The common practice of judging the character of curd for removal to cooler by smell and feel is responsible for mistakes in the degree of acidity. In some instances the curd is firm, and judged by this feature the cheesemaker runs off the whey, afterwards to discover a slow, weak, and sickly curd. Again, I observed, particularly in one instance, a soft, mushy curd, showing three-eighths of an inch of acid on the hot iron, and when removed to cooler the rapidly increasing acid gave unmistakable evidence of the risks of damage to the quality of the cheese. Managers cannot do better than use the iron test in conjunction with smell and feel of curd. If a mistake is made in taking the whey off sweet it is wise not to drain much on cooler, and to pile deep, firm, and keep warm.

Now that we are in the midst of the export butter business a hint or two in the preparation of the article and general appearance will not be out of place. In the majority of cases factories are paying strict attention to efficiency in manipulation, but a few persist in using a cheap and injurious quality of paper for packing, and to make the picture more unsightly, the finish on the surface of the butter is uneven and otherwise careless. Attention to the attractiveness of the butter commands the appreciation of home buyers, and with a greater consideration of suggestions given in reports issued by the Department on the examination of each shipment, the standard of our trade would be materially advanced.

The bad quality of much of the wood supplied to factories for export boxes calls for the manager's firmness in refusing to make use of knotted, cracked, unplaned, and otherwise objectionable timber. The appearance of many boxes on arrival at the Government Depot is without doubt detrimental to the butter industry.

I also wish to again bring before the notice of managers the purchase of inaccurate dairy thermometers, and to state that injury to the quality of cheese has followed their use. Out of four tests made at factories last month I found three varying from 1.5 deg. below to 2 deg. above at 100 deg F. on a standard instrument. Surely a serious consideration. The offer of the Department to test factory thermometers gratuitously ought to be taken advantage of whenever practicable.

DAIRY CATTLE—PURE *versus* CROSSBRED.

By G. S Thomson F.R.S.E., Government Dairy Instructor

The above subject is creating a good deal of interest at present, and opinions expressed by speakers at agricultural meetings disapproving of crossing breeds of milking stock have led to a tone of dissatisfaction among some supporters of the crossbred cow. It is very amusing to listen to the disclosure of a new discovery that ruination of our dairy herds will be inevitable if farmers do not waken to the necessity for immediate attention to the rules followed in stud breeding. We are well aware that in the absence of pure blood our cows will decline in milking characteristics, and become seriously reduced in value to the dairy farmer But there are conditions and circumstances to be considered, which cause the South Australian dairyman to accept crossbred animals with general approval and satisfaction.

It is to be regretted that the denouncement of the crossbred cow has been so emphatically made as to charge the dairyman with a violation of the laws of Nature. Surely this is an unwarranted statement, and hardly in accord with the principles of stockbreeding If a study is made of the early history of our domesticated animals, undeniable evidence is given of crossing being the initial step in the building up of our present-day valuable breeds of farm stock. That we have not departed from the laws governing a sound practice of breeding cows is proved by the improvement that has been steadily proceeding on lines best suited to the requirements of farm and district.

Fortunately the South Australian dairyman has been sufficiently observant and cautious not to fall into the grievous error of putting his entire faith in the results of highly attractive fattening and milking experiments conducted in different parts of the world, under the impression that the conclusions apply equally to dairy farming in this State. What would meet the demands of the dairyman in large cities is not necessarily to be followed in the northern areas of South Australia; neither would it be wise to adopt the system of breeding satisfactorily carried on in one district in other parts of different climatic conditions, and where situation and soil are unfavourable to success Every intelligent farmer aims at the most payable breed or cross, whether for quantity or quality of milk or beef, or a combination of both, and I think the average dairyman has been amply rewarded by a pursuance of the latter course to encourage him to further improvement in this direction.

To sacrifice flesh and constitution for quality of milk, and to grace the farms with dainty herds of cattle, is not calculated to impress the farmer with this modern fallacy in breeding. The misguided agriculturist who falls a victim to this dangerous teaching would give his labours in vain, and the losses would be most severely felt in districts where cheese production is extensively carried on, and where there is a good climate, fertile soil, and abundance of feed. The wrongful application of the above would appeal most to the farmer in the South-East, where the paddocks are waving with herbage and a good demand for butchers' meat existing at all seasons of the year.

To firmly adhere to one breed of cows for the dairying centres of South Australia would not give the best returns, as the hills districts, southern portions of the State, and the northern areas differ so much in natural conditions and other factors essentially important to success in the industry. If we agree that it has been sufficiently demonstrated that flesh and milk must go together in the cows in all good dairying centres, how unpractical the farmer would be to stock his lands with a light-bodied grade of cattle, expecting them to fulfil these payable demands.

The pretty and highly praised Jersey cow is beyond question a great butter-making animal, but her inability to make the best uses of a plentiful supply of natural feed depreciates her value in the estimation of those desirous of breeding a general purpose cow. I admire the Jersey breed, and shall continue to strongly advocate their numbers for stud purposes on the dairy farms; but to recommend the pure-bred islander for all districts would be a most mistaken policy to pursue. The farmer's practical experience of the unsuitability of the milk-worn Jersey for the butcher is universally accepted, and even when condition of body is claimed by artificial or natural means the fat is deposited on the intestines and other organs, and not where the meat value in an animal is highest. The Jersey cattle, when at their best, are reputed in agricultural textbooks, and by salesmen and butchers, to be thin and hollow in the neck, hollow and narrow behind the shoulder, sharp and narrow in the hooks, light in the brisket, and lean on the chine, with short rump and small thighs; they are also bare on the ribs.

In comparing the Jersey with the Shorthorn we have widely different characteristics, the latter being a big cow, yielding a large supply of good flesh, and showing superior qualities in milking, which place the Shorthorn in advance of the Jersey, and give her a premier place in the herd of the town dairyman and for general purposes. Further, the breed is endowed with a property of special value to the farmer in their ability to give to their progeny out of inferior cows their good features with remarkable certainty. But with all these great qualities in the Shorthorn, the richness of milk is much behind the Jersey, although the yield is considerably heavier.

Too much praise must not be given to these favourites, for the Ayrshire is not without a high place among dairy herds in South Australia, and no class of cows is better adapted to face difficulties and make the best uses of poor country than those hardy Scottish cattle. In our northern soils and hilly districts the Ayrshire would thrive, while the Guernsey, Jersey, Shorthorn and other breeds would suffer from the peculiarities of climate and country. And there are the Dexter-Kerry and Devon breeds, both esteemed for milk and flesh and hardiness, particularly the former.

But the all-round dairy cow has so many factors in its favour that one is obliged to give the cross a well-deserving and unprejudiced support. Unlike the dairymen of Britain, the Continent of Europe, and the United States of America, farmers in South Australia are so situated that their attention is devoted to keeping the general purpose cow, while the fat stock is left in the hands of the large station holders. In the majority of cases bull calves are destroyed, the heifers being kept for dairying purposes; and, as the meat market is only congested at times, the dairyman can always secure a good price for a fleshy animal.

That the Shorthorn cross of cattle has given satisfaction from a purely dairying standpoint is proved in the factory statistics, which show an exceptionally low weight of milk to make a pound of butter, and to my knowledge is superior to all other dairying countries. In the accomplishment of this object the milk yield from the cows has not been sacrificed; further, the flesh-forming capabilities of the cross at the close of fruitful years of milking go to make a combination of qualities not excelled by any other class of dairy stock. Farmers who practise the Shorthorn cross successfully know how much better it is to have a large quantity of rich milk than to cart to the factory a poor supply, requiring the same amount of labour; and while this profitable course of dairying is being followed, a healthy and vigorous condition of body is being maintained in the herd. In the breeding of small cows, let me ask how many farmers have suffered disappointment and loss in their heifers when brought into milk for the first time, afterwards to find them unfit for a place on the farm? And for the young cow's upbring the farmer has to part with her in the sale ring for a trifling sum of money from the butcher. Another objection to the small herd is the small supply of skim milk obtained for feeding calves and pigs. When all things are considered, we have not blundered, neither have we violated the laws of Nature. But we are not beyond admitting that more pure-bred cattle are wanted in the State to replenish our herds, and that crossing cannot give the same certainty of qualities in the progeny as obtained when two high-class animals of one breed are brought together.

It has been my effort since coming to South Australia to make clear to dairymen how degenerating it is to use bulls of inferior blood in their herds, and to at once discontinue the practice, and purchase animals of reputed qualities and guaranteed purity. Further, I have repeatedly pointed out that in raising the standard of a herd one must breed from the best cows on the farm, and continue to do so as long as dairying is the occupation of the farmer. I have always tried to impress upon dairymen that the first cross possesses, as a rule, the good qualities of the parents, while the progeny from further crossing the same animals are more liable to show inferior points. As the grade grows in quality the characteristic features become better fixed in the young milk cows increasing their reliability for dairying purposes, and, if continued on proper lines, a valuable strain of milkers would be the dairyman's reward.

In support of what I have said I will show by practical results that the cross between the Jersey and Shorthorn has fulfilled more than the demands claimed by exponents of the pure buttermaking breeds. Communicating with dairy factories on the subject, requesting particulars from milk suppliers as to the best breeds or crosses yielding the greatest quantity and quality of milk, I have received a number of replies; and in summing up the value of the various crosses and breeds there is a unanimous verdict in praise of the abovementioned cross. The following are extracts from papers forwarded to the Department of Agriculture:

Wilmington District.—"The farmers all seem of the same opinion, that the Shorthorn crossed with the Jersey is the best cow to keep. The average yield, as far as I can gather, is about three gallons per day when in full milk, or 550 per year." The percentage of fat in the milk from 19 farmers supplying 516 gallons a day ranges from 4 per cent. to 4.6 per cent., and averages 4.17 per cent. A higher percentage of fat will be reached as the season advances, this being the worst time of the year for quality in milk.

In the returns from a South-East factory, treating 284 gallons a day for cheesemaking, the undermentioned appears:—

Best Individual Cows.	Gallons of Milk per Day.	Percentage of Fat.
Jersey-Shorthorn	5½	3.8
Shorthorn-Aberdeen Angus	5¼	3.7
Shorthorn-Jersey	4¾	3.9
Shorthorn-Jersey	4	3.9
Shorthorn-Jersey	4	3.9

"Twenty other crosses of Shorthorn, Jersey, and Hereford gave over 3½ gallons per day, with 3.7 per cent. of butter fat. In the dry months, when feed is matured, these butter fat tests will average 4 per cent. at least, and as fresh cows come into milk the supply will be higher." From another factory 15 suppliers out of 35 sent in milk testing on an average 4.3 per cent. of butter fat. The cross was the Shorthorn-Jersey, but no mention was made of the yield of milk. The best cows giving milk to a small creamery, receiving 162 gallons per day, were Jersey-Shorthorn. I append the results from one day's milking:—

	Gallons of Milk.	Percentage of Fat.
No. 1	4	4.0
No. 2	3	4.0
No. 3	4	3.9
No. 4	3	4.0

As season advances the average yield of milk from cows will be less, with a higher percentage of fat.

The following factory records collected for the year 1901 from districts where the Shorthorn and Jersey strains are plentiful is further evidence of the suitability of the cross for milking purposes:—

Factory.—Out of a total number of 61 suppliers of milk to a factory in the hills the yearly averages of butter fat varied from 3.75 per cent. to 5.05 per cent., and only five averaged less than 4 per cent., and 12 reached 4.3 per cent. or over. The remarkable average for the year of 3,224 butter fat tests is 4.16 or a fraction over 21 lb. of milk to a pound of butter.

The accompanying table will show a comparison of the number of times 3, 4, and 5 per cent. of butter fat have occurred for each month of the year:—

	January	February	March	April	May	June	July	August	September	October	November	December
Under 4	15	9	6	2	3	1	3	11	32	38	33	22
4% and over	45	50	49	56	55	52	54	47	29	23	28	37
5% and over	2	3	7	4	4	9	5	4	1	1	1	3

Of 744 monthly averages, only 175 were less than 4 per cent., 525 were over 4 per cent., and 44 were 5 per cent. or over.

Another illustration of the quality of milk is given in the table to follow, which represents the supply to Clarendon Factory for the past year:—

Month.	Milk received	Butter made	Quantity of Milk to 1 lb Butter.		Milk Test
	lbs	lbs	lbs.	ozs.	% Fat.
January	61,974	2,817	22	0	4·0
February	41,607	1,750	23	12	3·8
March	35,129	1,513	23	3	3·8
April	29,278	1,453	20	2	4·4
May	31,770	1,413	22	7	4·0
June	25,232	1,220	20	10	4·4
July	31,738	1,452	21	13	4·2
August	43,993	2,010	21	14	4·2
September	62,011	2,606	23	12	3·8
October	93,181	4,253	21	12	4·2
November . .	88,369	4,078	21	10	4·2
December ..	66,294	3,065	21	15	4·1
	610,576 Total	27,630 Total	22	1⅛	4·09 Average.
			Average.		

Let us consider what standing among milking herds the Shorthorn and its crosses hold in Great Britain and the Australian States. At Tring, England, where the world-famous milking tests are held annually, the Shorthorns have enjoyed a marvellous role of success, which has done much to popularize the breed for dairying purposes.

In the metropolitan area of Edinburgh there are over 38,000 Shorthorns supplying milk to the city, and it is admitted that a finer class of stock for dual purposes is not to be found in any other part of the world. Their milk and beef producing capabilities have been developed by the Edinburgh dairymen to a surprising extent, returning to their owners the highest profits. At the London Dairy Show the exhibition of milking Shorthorns is one of the leading features, and when in England last year I was fortunate to be present each day at the show. After inspecting the rows of magnificent Shorthorns, whose characteristics displayed in a perfect degreo the true type of the milk cow, I felt impressed more than ever with the breed. Those interested in dairy stock will recollect the victory won at the London Show by the famous Shorthorn cow owned by Lady Henry Bentinck, whose record of 3 lb. 1¼ oz. of butter from two milkings was a highly creditable one. This was followed by a Guernsey-Shorthorn gaining the championship with a yield of 6½ gallons milk in the 24 hours of the test. As Great Britain is the breeding centre of dairy stock for the world, it is not to be expected that crossing would be profitably practised from a breeder's point of view.

Let us also consider what results have been attained by the Shorthorn-Jersey at the leading shows in the Commonwealth. At the National Show of Victoria held this summer the first and second prizes for butter production went to cows of the above cross; and at a previous meeting the same cross obtained the highest honours with 3.76 lb. of butter in two milkings, which was equivalent to 26.32 lb. for the week, the yield of milk being very heavy. In Queensland the Shorthorn-Jersey secured the first prize as a butter cow at the well-conducted Rockhampton Show this summer, after being 137 days in milk. This cow gave 30½ lb. of milk during the 24 hours, with 5.2 per cent. of butter fat. In our own State this season the Shorthorn and Shorthorn-Jersey were awarded first, second, and third places for yield and quality of milk by the Mount Gambier Agricultural Society. I have before me a press report from Victoria showing that a dairy herd of the Shorthorn-Ayrshire cross gave an average of 788 gallons of milk for the year, with 3.7 per cent. of butter fat, making 336½ lb. of butter for each cow. Who can despise the Shorthorn breed after these results?

In treating my subject I have perused standard works on stock, from which the following extracts are taken, to more thoroughly verify my contention. The origin of most breeds has arisen from a cross. We have, for example, the Dexter-Kerry, called after the name of the breeder. Also in certain parts of Ireland breeds exist which have originated in a cross of imported breeds with native cattle, and Professor Carrol of that country, points out that their great milking qualities have been so increased that 1,000 imperial gallons of milk per annum have been obtained from some of them In England, Wales, and Scotland similar instances are forthcoming as to how the breeds were raised; and nearer home we have an illustration, for in the leading dairy districts of New South Wales there is a type of famous milkers known as Illawarra dairy cattle, which has been built up in accordance with the requirements of that district. The precise origin of this type is a matter of conjecture, but, judging from the photographs, they are a very fine type of milkers, and compare most favourably with the Shorthorn in appearance and general characteristics.

To show the advantages of crossing in the production of new breeds, it would be difficult to find a more striking picture than the one given in "Youatt's Complete Grazier" in its true treatment of the pig. Discussing the necessity for the pigbreeder to consider what breed or cross will pay him best in his particular district, the writer goes on to say:—"If we take the United States an an example, we find that our American cousins have been very industrious in forming new breeds, and also in rechristening, perhaps, some of our old ones. In the latter category some persons place the Suffolks of the States, which appear to be nothing else than our middle white; their Essex is our small black; their Duroc-Jersey is very like our Tamworth; their Chester white has a striking resemblance to our old-fashioned, lop-eared white pig, found in the counties of Cambridge and Lincoln, with just a dash of the middle white to give it quality. Again, the Poland China, a breed which has more admirers than any other breed of pigs in the States, would appear to be a combination of Berkshire, Duroc-Jersey, and Chester White, and bears a most striking likeness in colour and formation, except in the more drooping ears, to the Berkshires of 30 years since. The Victoria, another noted breed in the States, has been built up within the last 25 years, apparently from the Suffolk, alias middle white, and a greater proportion of the white breed in its constitution, and to the fact that the white pig is a far older variety than the Berkshire, so that its colour dominates in the offspring."

In an article on the cow, read before the British Dairy Farmers' Association, and printed in different works on agriculture, appears the following:—"What constitutes a good cow? The answer, I think, must be the one that is the most profitable, rent-paying animal, looked at from all points I do not like to hear any man or newcomer into a district set up his opinion too decidedly against the usages of that district, or to run away with his own ideas or fancy, as to drive on headlong in the belief that some particular breed is the best for all soils and climates. Such a man—and we often meet with him—generally, unless he sees his error in time, comes to grief. The great and chief point is to obtain a cow that is a heavy milker; but you must get this without sacrificing form, size, or quality. This, I firmly believe, can be and is now extensively done, and reduced almost to a certainty, by careful selections and using fresh strains of blood." The writer comments on the wrong of adhering to one breed, whether for milk or flesh, and adds:—"To push either of these systems to the extreme is bad. We want the two so blended together as thereby to provide milk, form, and constitution. In starting a herd, no matter of what breed, it is necessary, after selecting the cows as carefully as circumstances will permit, to use only bulls from dams of known good milking properties. Having done this carefully, note the quantity and quality of milk given by each animal. Then weed out from time to time for disposal as beef or otherwise all failing to reach such a standard as is considered profitable and satisfactory. Care and some patience are necessary in the treatment of heifers, as, although bred from known milking strains, they will sometimes, from various causes, do badly with the first calf but when rightly descended they generally repay you with the second calf."

From the "Transactions of the Royal Agricultural Society of England" I give the views written by a well-known authority on stock, Mr. Gilbert Murray:—"Soil and climate to a considerable extent fix the habitat of the different races of our domesticated animals. Whatever the breed, the first stage of improvement must begin with the male, and to this end it is essential that pure-bred sires be used. I have known many instances in the dairying districts of well-bred Shorthorn bulls being used for a few years; then, on the mistaken notion of a narrow-minded economy, a bull calf is saved from a favourite cow, and eventually used in the herd, which soon reverts to its original state To a tenant farmer of ordinary intelligence I cannot conceive a more interesting and profitable branch of his calling than that of building up a herd of milking cows, let the breed be what it may. Throughout the dairying districts of the Midlands we pin our faith to what is generally known as the home-bred or Yorkshire Shorthorn, which, for the general purpose of the locality, cannot be excelled. A proof of the general result of using a pure-bred sire. I know a man who began breeding with a very inferior herd of cattle the greater portion being the black Welsh, and by using pure Shorthorn bulls for three or four generations he produced from them a very respectable herd of Shorthorns, and entirely lost their black colour. Yet I doubt not that if he had ventured to use one of the bulls bred by himself the black colour of his Welsh ancestors would have appeared again."

As crossing is not confined to heavy stock, let us read what is given by Compton in the Australian book of poultry in proof of its applicability to the feathered family:—"In farmers' stock, where the production of eggs and meat are the prime consideration, it is a good plan to change the breeding cocks each year, to infuse new stamina into the stock, which will do much to secure an immunity from disease, and tend towards increased size in the progeny. But for the fancier, whose sole object is to produce high-class specimens, such proceedings would be most unwise, as inbreeding must be resorted to, so as to firmly establish certain given characteristics in a strain of high-class poultry. This would be all undone if a fresh cock from some other strain were introduced each year." The writer goes on to say:—"It is well known that cross-bred birds of pure breeds grow much faster, fledge more quickly, and mature earlier; and are on these grounds alone far preferable for market purposes or egg production than pure birds at all inbred."

In Stonehenge's book on the dog very striking notice is paid to the subject, and I think readers will pardon me for adding a little more matter to this vitally important question. In the chapter on crossed breeds he says:—"Although many of the breeds which have been enumerated in the preceding chapters were most probably originally the produce of crosses between distinct varieties, yet at present they are continued by breeding from a sire and dam of the same kind, whereas with those which we are now considering there is constantly a necessity for having recourse to the original breeds. For instance, some breeds of the greyhound are known to be crossed with the bull, and the identical animal with which the cross first commenced is well ascertained. So also with the foxhound though here the particular cross is not so well determined; but it is admitted to have taken place within the last century. Yet these are not called mongrels, and the breed, instead of being despised as such, is more highly prized than those of the pure strain which formed one side of the parent stock. The term mongrel may more properly be applied to those chance crosses which occur from accident or neglect, the bitch selecting her own mate, and being guided by caprice without reference to the fitness of the match in regard to the progeny resulting." . . . . "The retriever dog," Stonehenge writes, "possesses qualities of great delicacy of nose and power of stooping, cleverness to follow out the windings of the wounded bird, love of approbation to induce the dog to attend to the instructions of the master, and an amount of obedience which will be required to prevent his venturing to break out when game is before him. The curly-coated variety of retriever is always a cross between the St. John Newfoundland and a water spaniel, which is generally Irish. The large black retriever, if crossed, is known by his resemblance to the small Newfoundland and the Irish water spaniel, or setter, between two of which he is bred, and the forms of which he partakes of in nearly equal proportions, according to the cross. Again, many of our smooth terriers are slightly crossed with the bulldog, in order to give courage to bear the bites of the vermin, which they are meant to attack; and the lurcher, which is a distinct and well-known cross, is par excellence as the poachers' dog, for his great speed, combined with good nose and his silence. The southern hound is now extinct in its purity, all now existing being more or less crossed with other breeds to increase the pace required by modern fashion."

Just as crossing has been of the highest economic value to the dairy farmer, the horsebreeder has enjoyed his share of success, while the sheepfarmer has not neglected to experiment with his breeds, and, judged from the very satisfactory results for wool and mutton in the export of these products, it surely commends itself as a profitable practice. Similarly has crossing been followed in the case of cereals, for our best wheats have been derived by artificial means or a natural cross claiming special characteristics most suited to the requirements of market and district. The same may be said of the potato and other garden vegetables, and it is not to be wondered at that the science has extended to more remarkable results in the hybridizing of fruits and flowers

In conclusion, I wish it to be thoroughly understood that this paper has not been written to unduly claim too much for crossing and to slight pure breeding for such would be a most undesirable course to take. But, as will be gathered from the contents, my object has been to claim for crossing what it is deserving of, where breeding from pure stock cannot be entertained on the average farm and where general conditions and market favour the dual purpose cow. Further, this paper is in defence of the system of crossing in so much that we have not gone against Nature, and to expose and correct misunderstandings surrounding this very important branch of dairying. Surely it might be beyond suspicion that every dairy farmer in the State has reason to commend the highest praise of our owners of purebred cattle, knowing that expense and trouble have been a secondary consideration in their laudable efforts to advance the standard of dairy farming. Purebred stock are wanted more and more, and it is to be hoped that all our breeds will be kept pure in the State, and that farmers will see the necessity for patronising the enterprise which has been so characteristic of the importers of the Ayrshire Holstein, Jersey, and Shorthorn cattle.

CHANNEL ISLANDS BREEDS OF CATTLE.

By G. S. Thomson, F.R.S.E., Government Dairy Instructor.

Very seldom a meeting of dairy farmers is allowed to pass without a question being asked on the Channel Islands breeds of milking stock. It is a much-debated subject as to the existence of an Alderney breed, and as the name is frequently applied here to cattle having Jersey characteristics, it will be of interest to know that the general opinion is incorrect. This I have pointed out in answer to question, while admitting that the subject is of little importance to the farmer. The following are replies received some time ago in answer to my enquiries:—

The Alderney News stoutly maintains that there is a distinct breed of Alderney cattle. "We all know," says the journal mentioned, "that they cease to exist as Alderneys when once they reach Guernsey, for by some most extraordinary metamorphosis they become Guernseys immediately, and in a few weeks fetch a price something like four or five times that originally paid to the Alderney farmer. That being the case we can quite understand why some of our friends (?) across the water invariably make the misstatement. It is to their advantage, and if the truth was really known, some of the finest cattle exported to America as Guernseys are the pick of the Alderney race. But no one is to blame for this but the Alderney farmer alone. He will not bestir himself to make and keep his breed distinct. The price paid for Guernseys would have been his years ago had he only the pluck to keep a register of the pedigree of his animals in the shape of a herd book. Some time ago we heard a great deal of this latter. Where is it now? What has been done? Has it, too, gone the way of all things in Alderney? Nothing seems to encourage the breeder to keep going ahead. The book is ready, and all that is to be done is for them to register their cattle. Yet this even seems too much trouble. The reproach cast upon them by those who are reaping a rich harvest through our insular apathy could be removed at once if they would only be up and doing. They must not expect that the prices will go up at a bound if once they register it is a gradual thing—but once let Alderney get its cattle as a recognised class at English Shows, then they would see for themselves what the result would be. Americans would become our customers, and prices would be for really good cattle what has often been dreamed of but never realized. However, let it be clearly understood, there is a pure and distinct race of cattle here. Alderney has never been famed for it. The old breed of cattle in Jersey was a black one (vide an old and interesting Channel Islands history); Guernseys are not mentioned in it at all, whilst Alderneys are justly praised for their all-round excellence."

The Scottish Farmer states —"The Alderney has been commonly understood in this country as applicable to all the breeds of cattle imported to England from the Channel Islands, as well as from Normandy and the adjoining coast of France, all these breeds of cattle being at one time popularly designated as Alderneys. But the Alderney is still a distinct breed, known in that island from which it derives its name, and is somewhat bigger than the Jersey; but few of them have been brought into this country, and are not exhibited at the leading shows, like the Guernseys and Jerseys. The distinctive features between the former and the latter are that the Jersey is smaller in size, more delicate in constitution, and of a more graceful form." A third reply from England confirms what has been said

COUNCIL OF AGRICULTURE.

[The report of the July meeting of the above did not appear in the August issue of The Journal, for the reason stated in Departmental Notes in September issue. At the special request of the council the report is now published.—Ed.]

The July meeting of the Council of Agriculture was held on July 29 all the members but Mr. Hardy being present.

Mr. R. Caldwell was elected Chairman for year ending June 30, 1904, and the various committees for the year appointed.

It was resolved to support the Bill proposed to be introduced by the Hon. Minister of Agriculture to provide for a legal standard weight of 42 lb. gross for the bag of chaff.

It was decided to ask Professors Perkins and Towar to draw up a list of standard agricultural works suitable for country institutes, and also that a list be prepared of all publications in the library of the Department of Agriculture, and that the Branches of the Bureau be advised of same and also of time and place where the books may be inspected by visitors.

The Hon. Minister advised that without evidence of the value of the alleged discovery of codlin moth parasites in Spain he could not see his way to sanction any expense in the matter. Suggested alterations in regulations dealing with the importation of plants were referred to the vine and fruit committee, with power to act.

It was decided to recommend the Hon. Minister to have the Cape tulip (Homeria sp.) declared a noxious weed, and its eradication enforced.

New branches were approved at Petna Well, with Messrs. M. W and W. J. Johnson, R. J. and G. E. Cox, E. H. Fiddaman, T. Talbot, H. Wallschutzky, J. Hull, R. and W. Penna, D. O. Symons, W. Lutzke, A. Thomson, G. Barclay, and B. Norton; and at Athenna, with Messrs. J. Dunnet, J. H. Smith, G. Starling, W. Parsons, W. McKenzie, G. J. and W. O. Gale as members. New members of branches were appointed as under:—Yankalilla, Mr. G. Putland; Gladstone, Messrs. O. A. Tunbridge, D. D. Smith, and A. P. Cook; Cradock, Messrs. I. H. Iredell, jun., and T. Fitzgerald; Hartley, Messrs. F. Fry and S. Pratt; Kingston, Messrs. A. D. Tapsfield and V. Redman; Redhill, Mr. W. Wilkins; Eudunda, Messrs. E. Schiller and W. F. Stange; Holder, Mr. E. Burrows; Wepowie, Messrs. J. Fisher, J. Bishop, G. Roberts, and J. Crocker; Ardrossan, Mr C. B. Morgan; Murray Bridge, Messrs. H. Patterson and W. Wundersitz; Kanmantoo, Mr. J. G. O'Neill; Mount Remarkable, Mr. M. G. Giles; Mundoora, Mr. J. Owens; Whyte-Yarcowie, Mr. C. Francis; Morgan, Mr. W. Lindner; Bowhill, Messrs W. Johns and H. W. Whitfield; Willunga, Mr. C. Manning; Morphett Vale, Mr. D. S. Forsyth; Elbow Hill, Messrs. C. and J. Elleway and J. Hay; Golden Grove, Mr. H. Haines.

The monthly meeting of the Council of Agriculture was held on Thursday, October 22, there being present Messrs. R. Caldwell (chair), A. Molineux, F. Krichauff, Col. Rowell, J. Miller, T. E Yelland, G. R. Laffer, and R. Marshall.

The Chairman and Mr. Laffer reported having attended the Conference of the Hills Branches of the Agricultural Bureau at Cherry Gardens. The attendance of Bureau members was very poor, and there seemed a lack of enthusiasm amongst those present.

The Chairman read a brief report of visit by members of the council to Wasleys and neighbourhood, and a short discussion ensued on the condition of the crops and the growing of rust-resistant wheats.

The secretary reported that, as far as could be ascertained, it would cost about £5 for each weed it was proposed to illustrate in colours, as desired by the council. The Minister had approved of a set of four illustrations being prepared to ascertain the actual cost and the value of the work. In all ,there would probably be from 30 to 36 injurious weeds to illustrate, but in any case the work would not all be put in hand at once. After some discussion, it was resolved that coloured illustrations were unnecessarily expensive, and that line or photo blocks similar to that of the "Cape Tulip," published in the September issue of The Journal of Agriculture, would meet all requirements.

Some discussion took place on the "iceplant," which was reported to have spread over such a large area of cultivated land. The secretary stated that, judging from reports, there were at least three different plants known in the north as "ice plant," two of which were useful fodders.

Mr. Miller moved that the Branches of the Bureau be asked to report on the varieties of rust-resistant wheats grown in their respective districts. In view of the losses from rust this year, information on this point would be particularly valuable. The secretary stated that the Department had already taken this matter in hand, and a circular was being sent to the Branches asking for the information necessary to prepare a catalogue of such wheats.

On the motion of Mr. Molineux, it was decided to appoint a committee of the council to deal with Agricultural Bureau matters. Messrs. Krichauff, Molineux, Miller, and the Chairman were appointed members of the committee.

The following gentlemen were appointed as members of the undermentioned Branches of the Agricultural Bureau:—Onetree Hill, Mr. J. Blake; Clare, Mr. J. Dall, jun.; Gladstone, Mr. T. E. Inglis; Baroota Whim, Mr. W. Dahlenburg; Denial Bay, Messrs. A. Croker and T. Doyle; Port Pirie, Mr. T. Teague; Watervale, Mr. J. Ward; Morchard, Mr F. X. Beck; Richman's Creek, Mr. J. S. McSkimming; Cherry Gardens, Mr. A. Stone.

FARM AND DAIRY PRODUCE MARKETS REVIEW.

Messrs. A. W. Sandford & Compy. report November 2, 1903:—

Although the weather throughout October was somewhat variable, still, taking it all round, farmers could scarcely hope for better conditions for the successful ripening of the crops. Certainly a portion of some of the districts suffered from a severe hailstorm, but the area of damage was not great. The season is considered a late one, and it is most unusual to see the abundance of feed available, and in such green condition, at this time of the year. Reports from the Northern Areas state that ample supplies of water are obtainable, and stock throughout in excellent condition.

In commerce, merchants have experienced an unusually active time; the excellent harvest prospects—the yield of wheat, which is certain to be the best for many years—have given country folks more heart to purchase their requirements, whilst on the other hand wholesale houses have traded more freely. In Metals, Copper has made considerable advance, mostly owing to the shutting down of some of the larger mines in the U.S.A., whilst Silver has also hardened, but Lead remains about stationary.

Breadstuffs. London advices report that the unsettled weather, culminating in violent storms, did great damage to Corn, both in stacks and in the fields, although northern parts of Britain did not suffer to the same extent. However, high prices were paid for American Spring Wheats owing to scarcity, but a break in U.S. quotations brought values down quite 6d. per quarter. On the Continent the markets also have had a steady decline of 6d. per quarter. In France harvesting is finished, but the quality is indifferent, and estimates of yield vary considerably. Latest cables report the value of Australian Wheat, January shipment, at 30/9 for 480 lb. Very little business has been done during the month in the Commonwealth. The Wheat "Pool," which has the command of all imported Wheat and Flour in Melbourne and Sydney, continues to meet the market, and although some 14,000 tons have been reshipped to London, there will still be a surplus remaining when the new wheat comes in. Reaping has begun in Queensland, and if all goes well the yield will be a record. In this State Wheat and Flour are very scarce indeed, and further reimportations of Australian Wheat have been made from Sydney, the Wollowra, which arrives on November 5, bringing some 2,500 bags. There is, however, very little more left to come. New Wheat is being delivered at Ports Germein, Pirie, and Broughton, but so far the samples leave much to be desired. Reaping, however, will not become general for fully a month, and unless we have unfavourable weather the sample will be sure to improve. In Forage lines very little business has been done in either Bran or Pollard for prompt delivery, but some forward contracts have been made. Chaff.—Trade in this is exceptionally quiet owing to the plenteous supply of feed, and little or no export orders received. Local business is also very dull. Feeding Grains.—Although values are lower than they have been for years business is almost stagnant, whilst Barley quotations are nominal.

As the season for the Gambier grown Potatoes draws to a close, the demand is restricted only to prime well-kept or lots that have been pitted; still there is no change to report in values. Meanwhile new locals are coming along remarkably well, and as they are meeting with good sale an advance on present rates is expected. Onions.—The lateness of the season enables South-Eastern Onions to still command the market, but no heavy parcels have been put through. In this line new local grown are also beginning to influence trade.

In Dairy Produce, the month just passed stands out boldly in the increased quantities marketed, compared with corresponding period of past few years, the favourable weather enabling factories and dairy folks to forward for sale their butters in firm order. Top grades of Fresh in Prints have eased about a penny in sympathy with the lower quotations for Bulk, but other lines have well sustained, owing to bakers and potters continuing to take advantage of the cool weather-made butter. Buyers for London have been operating, and shipments made throughout the month of both Dairy and Factory-packed Bulk, so that the market has been kept well cleared; but at the time of writing buyers are not just as eager to purchase, except at a slight concession. Eggs.—Export trade has been very heavy both to the East and Western States, especially during the early part of October, but Melbourne having again gone back prices here in sympathy show an easing of about a penny. Cheese.—New make is supplying all demands, and shows only a slight easing in values, but with the setting in of warmer weather, when increased consumption of this article is experienced, prices should maintain. Bacon has been in good request, nice orders from Western Australia keeping the line active. Hams have had rather a bad time. Honey.—In the absence of export orders prices have had to give way slightly to effect business. Almonds.—Although no heavy parcels available, these have been rather slow of sale.

Carcase Meat.—Farmers have been enabled through the lateness of the season to forward Pork and Veal with comparative safety almost up to the end of past month, and good rates have ruled.

Live Poultry. Supplies in this line have not been nearly equal to trade requirements and with exceptionally active competition prices realized have been abnormally high.

MARKET QUOTATIONS OF THE DAY.

Wheat.—At Port Adelaide, shipping parcels, 5/ for old; new, 3/5 per bushel 60 lb.

Flour.—City brands, £13/; country, £12.

Bran.—8d.; Pollard, 10d. per bushel of 20 lb.

Oats.—Local Algerian and dun, 1/9; white champions, 2/ per bushel 40 lb.

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orchard, meant a return of £330 per annum. He put down the cost of cultivation at double what it could be done for. His actual estimate was:—

Ploughing	5/ per acre.
Scarifying four times	5/ per acre.
Hoeing round trees twice	5/ per acre.
Pruning	3/6 per acre.
Extras	1/6 per acre.

At Glengyle Orchard the actual cost did not exceed 12/ per acre per annum for the first few years after planting, but the ground was ploughed once, scarified once, and the trees hoed round only once during the season. The weeds grew well, but so did the trees. Where codlin moth had to be dealt with there would be an extra outlay, but this after all would be small; actual operations at Glengyle Orchard showed that they could spray four times at a total cost of 20/ per acre for the young trees, and 28/ for the old trees. They used a powerful pump with a boy to work, and two men to spray He thought he had shown that under a proper system of cultivation they could, if necessary, produce apples at 1/ per case.

Mr. Summers questioned Mr. Grasby's costs of cultivation. The ruling rate of wages for orchard hands was 30/ per week, or, say, £78 per annum; according to the figures given one man should be able to do all the work on an orchard of 80 acres; and then nothing was allowed for horses, wear and tear of implements, &c He very much doubted whether even the £2 per acre would do all the work Mr Grasby put down in his estimate

Mr. Hughes also questioned the figures. They must always allow for a lot of lost time in the winter when the horses had to be fed and no work could be done. The estimate did not include house, implements, horse stock, and other necessary outlay.

Mr. Grasby, in reply to Mr. Summers, said he was sure a man could look after 80 acres of orchard on the lines he had laid down In reply to other questions he said that trees planted at 16½ ft apart would probably last as long as those planted 20 ft apart. He knew of a small orchard in Tasmania where the trees were only 10 ft apart, these were now 35 years old, and were still bearing heavily.

Mr. Jacobs said they could not break up the land 1 ft in depth for 30/ per acre, but Mr. Summers stated that with the reversible plough the work had been done on cleared land within the price mentioned

Mr. Quinn said he could bear out Mr Grasby's statement that there was little to fear from the competition with stored apples A year or two ago a large number of American stored apples were put on the market in competition with Australian apples, but failed to fetch within several shillings a case of the latter The Cape was a far more likely competitor, but while they would have to accept lower prices in the future he thought they had nothing to fear in this direction, as with lower prices in England the demand would increase immensely

CODLIN MOTH.

Mr. W H Hughes read a paper on the question of compulsory spraying for codlin moth, and on the sale of infested fruit Recently the growers with 200 trees and over were asked their opinions on these questions, and the publication of the results from the departmental tests last season undoubtedly put them in a better position now to answer the first question than they were formerly. These returns, though most interesting and instructing, might be considered misleading on one point, viz., the actual quantity of fruit saved by spraying at the costs stated. In the July issue of The Journal of Agriculture the cost of spraying is given in Mr Vickers' case as 433 cases sprayed for £6 11/, or a fraction over 3½d per case Mr Vickers did not, however, save these 433 cases as a result of spraying, as there were 89.9 per cent. clean fruit on the unsprayed trees as compared with 95 per cent. to 98 per cent. on the sprayed trees. Actually, then, the spraying only saved about 32 cases, which makes the cost 4/1 per case. This would not pay any grower. Dealing with Mr Hannaford's returns in the same way, he saved only 117 cases at a cost of £5 16/8, or, say, 1/ per case On the other hand, Messrs. Dall, of Clare, and Maughan, of Houghton, had 33 per cent. and 22 per cent. respectively more clean fruit on their sprayed trees than on the unsprayed, and he certainly thought that in both cases the spraying paid well. It appears from the returns that if the work is properly done up to 95 per cent. of the fruit can be saved in badly infested gardens, and as it will pay to spray under such conditions, the grower will not require compulsion. Where, however, there are only a few codlin moths in a garden it would cost more to spray than the value of the fruit that would otherwise be lost, besides entailing a heavy outlay for spray pump, &c. Why, therefore, compel the grower to spray at a loss? In the September Journal the replies to the queries previously referred to are given; 202 growers, representing 193,451 trees, answered the circular. The districts of Wirrabara, Stanley, Barossa, and Coonawarra are almost unanimous in opposition to the sale of infested fruit, and largely in favour of compulsory spraying. They could fairly assume that these men were mainly exporters, and as clean fruit was essential, it would doubtless pay them to spray; and according to the results already obtained it would matter but little whether their neighbours sprayed or not, as they would still save nearly all their fruit if the work were done thoroughly. Take the larger growers in the hills districts, and the opinions are very different; and these growers represent twice as many trees as the other four districts together. Of the hills growers 27 favour compulsory spraying, and 99 oppose it; 66 favour the sale of infested fruit, and 57 are against it; 71 would make scraping and bandaging the trees compulsory, while 52 growers oppose these practices. And, besides, there are hundreds of smaller growers in the hills who were not consulted in the matter; they far outnumber the small growers in the other districts, but what do they think? It seemed to him that if customers in Adelaide want grubby fruit at cheaper rates than sound, why should they compel the grower to spray or prevent him selling the unsound fruit? If the customers demand clean fruit the growers will have to grow it for them. The purchasers have the matter entirely in their own hands without the expense to both growers and the State that the enforcement of compulsory spraying would entail. Competition was the order of the day, and if one man does not produce what is required by the buyer another man will. Then as to bandaging, the returns published in The Journal certainly show that where the trees are thoroughly sprayed very few caterpillars are found in the bandages. At Mr. Sage's orchard the total number of caterpillars caught during the season was nine per tree where four sprayings were given, and two per tree when they were sprayed five times. Mr Vickers only averaged two caterpillars, and Messrs Beaumont and Maughan one per tree for the whole season. Bandaging may be a very good practice on unsprayed trees, but surely the above figures show that in a sprayed orchard it was not worth the labour. Besides bandaging a tree and leaving shelter such as hedges, sheds, sties, and rubbish in the orchard must be waste of time. He thought these matters were best left to the growers and their customers to settle

Mr. Jacobs thought Mr. Hughes's figures were against his own arguments; if only a few caterpillars escaped on sprayed trees it would surely pay the grower to trap these, even at a heavy cost, in order to prevent as far as possible any escaping to breed next season.

Mr Monks said Mr. Hughes's argument was doubtless all right from his standpoint, but he could not agree with him. What about the hundreds of small gardens where nothing was done to cope with the codlin moth? To his mind this was the biggest point of the whole question. It was most unfair that the bona fide grower should be continually put to the expense of spraying, while his neighbour was breeding moths unchecked. The careless grower must be legislated against; he certainly favoured compulsory spraying to reach them. Spraying had been proved effective; then make these men spray their trees or get rid of them. It was all very well for Mr Hughes to say that if the customers did not want the grubby fruit growers would quickly set to work to produce clean stuff. In most cases the codlin fruit was fraudulently palmed off on the consumer; topping up with a few sound fruits to deceive the buyer was only too common.

Mr. Grasby said last year's figures could not be taken as a fair comparison, as owing to the previous crop being very light there were less caterpillars to carry over the winter; and, besides, owing to the late autumn being so dry many caterpillars which would have otherwise remained dormant through the winter changed to moths prematurely, and as there was no fruit for the young caterpillars to live on they succumbed. It was generally admitted that the codlin moth attack last year was very light. He was convinced that under average conditions sprayed trees would give 20 per cent. to 30 per cent. more clean fruit than the unsprayed, and this certainly would pay. He thought, however, the question of compulsory spraying need not be discussed, as the Department was not at all likely to recommend it.

Mr. Laffer opposed compulsory spraying because it could not be enforced. He would point out that the returns from the departmental tests were, in some cases misleading, as owing to the small fallen fruit not having been examined the figures did not really show the percentage of infested fruit All of them knew very well that a large quantity of fruit in the infested gardens fell before it was half-grown, and if these had been examined the difference in favour of spraying would, in his opinion, have been much greater. His own orchard was sprayed four times, with the result that whereas formerly it was not unusual to pick up and destroy 600 bushels before the fruit was ripe, he found very few fallen infested fruits, and scarcely any caterpillars in the bandages. As his crop the previous year was the best he ever had the freedom from moth this year could not be put down to the cause stated by Mr. Grasby. He was convinced that he could, on the average, save 90 per cent. of the fruit by spraying, and would sooner pay the bill for this work than have to meet the expense formerly incurred in picking the infested fruit from the trees and gathering up that which had fallen. He would entirely prohibit the sale of infested fruit; it was the only way to make the careless grower look after his orchard The codlin fruit only depreciated the value of good fruit, and also lessened the consumption of fruit locally as few consumers would buy infested fruit intentionally. It was true plenty was sold, but in most cases the buyer found he was sold also.

Mr Quinn, in reply to question, said that there was absolutely no reason to expect any evil result from the continued use of arsenical sprays Last year five or six growers scorched their trees, but as hundreds of others using the same mixture did no damage the fault was evidently with the growers There could be no cumulative injury if the mixtures were properly prepared as the arsenic was not absorbed into the tree. He agreed with Mr. Laffer that the small difference between the clean fruits on the sprayed and unsprayed trees was partly due to the neglect in some instances to keep a record of the small fruits that fell. Great numbers of infested fruits dropped before they are an inch in diameter. Mr. Hughes had hardly made fair use of the figures in reference to the questions sent out by the Department. Although it was true that in the hills a small majority of the commercial growers favoured the sale of infested fruit, those in opposition far outnumbered them when it came to the area of orchards. His experience was that of the people that bought apples for their own use there were very few indeed that would willingly buy grubby fruit. He was convinced that where a man had not to contend with careless neighbours he could save most of his fruit by spraying four times, but if the man next door did nothing he would have to spray once or twice more. Was it fair that a man with perhaps only a few trees, which were of no particular value to him, should be allowed to put the other to this expense? While he opposed compulsory spraying as unworkable, he was convinced that the only way to deal with the codlin moth question was to strictly enforce the law against the sale of infested fruit, and in this way compel the grower to take such measures as had been proved effective.

SPRAYING EXPERIMENTS.

Mr. E. J. Olan, of Longwood Branch, read a short paper on his experiences with Bordeaux mixture and arsenite of soda. Spraying in itself was not a difficult operation, but two things conspired against the grower. The first was the weather, and the second want of time to do the work without allowing some other work to suffer this was specially the case with those who also grow vegetables. For shothole in plums, apricots, and cherries he found Bordeaux mixture, applied about the end of August, and again in the second week in September, effective. For apple scab or fusicladium the Bordeaux mixture gave splendid results on several varieties, but the Stone Pippins were not so clean, partly due to the fact that he was unable to spray later than the middle of October. He had very little experience in spraying for codlin moth. From his observations, however, he was convinced that with the later maturing varieties the period from February to April was the most critical time. He had only given his trees one spraying, and certainly had a fair amount of success, especially with Gravensteins. On the Ribston Pippin and Rome Beauty apples and on some pears he noticed a few small brown spots, beneath which he found a small dead grub. Whether the grub had been killed by the poison he was unable to say. To see whether the arsenite of soda would injure the trees he tried a few experiments. He used double the ordinary strength solution, and sprayed the trees until the spray ran off. As soon as the trees were dry they were again sprayed heavily. The Irish Peach apple showed hardly any ill-effect, a few leaves only being burnt On the Emperor Alexander nearly all the fruit and leaves fell; no fruit fell from the Vicar of Winkfield pear, but it turned a rusty brown colour; still they thrived well, and the foliage appeared to have benefited The Uvedale St Germein pear showed no trace of injury, either on the fruit or the foliage Under ordinary conditions the trees would only be damped with the spray, so that the test was a very severe one.

Mr. Monks thought a great mistake was made in spraying too early with arsenite of soda. He had never found caterpillars in the bandages in the hills districts before the middle of December, and if they allowed a full month back to egglaying they would see that, in the later districts at any rate, it was of no use spraying before November 10, or thereabouts The time would, of course, vary according to the earliness of the district. He believed also that by waiting until the fruit and foliage had properly set there would be no risk of burning. It was also a mistake to apply too much spray; the foliage and fruit should be merely moistened with the liquid Imperfect agitators in the spray pumps were also partly to blame for the damage.

Mr Quinn said it had been asked why the Department was not continuing the demonstration plots. The reason was that it had been proved by so many growers beyond question that spraying with arsenite of soda was effective that no good purpose would be served by continuing last year's tests

FRUITGROWERS' ASSOCIATION.

Mr. Laffer mentioned that a Fruitgrowers' Association had been formed in South Australia, and he appealed to all growers connected with the Bureau to join. There could be no doubt that the future of the industry was bound up in the better marketing of their produce, and the extension of their markets. This was particularly the case with apples; if they could get their fruit carried to London and elsewhere at reasonable freights and in good order there was an immense opening at a price that would pay them At present they were practically at the mercy of the shipping companies, but by acting in conjunction with similar associations in the other States they would be able to secure better treatment It was not that the growers wanted a larger profit, but they recognised that with the heavy freights and charges the market must always be limited. Other points that the association could do good work in could be mentioned, especially those connected with the utilization of their surplus products, and the handling of fruit on rail and steamer in connection with the interstate trade. The subscription to the association was only 5/ per annum, and any one owning 200 fruit trees could become a member.

STANDARD WEIGHT FOR CHAFF.

On motion of Mr. Jacobs it was unanimously resolved to support the Ministry in bringing in legislation fixing a standard legal weight for a bag of chaff. The practice of chaffing straw with hay and selling it as prime chaff was also strongly condemned

NEXT CONFERENCE.

The invitation of Woodside Branch to hold the next Conference at Woodside was accepted.

A vote of thanks to the Chairman and hon. secretary of the local branch and to the gentlemen who had read papers brought the Conference to a close.

RUST-RESISTANT WHEATS.

The Department of Agriculture has been asked to prepare and issue a catalogue of the rust-resistant and rust-escaping wheats grown in South Australia. Recognising the value that such a list of wheats would be to our farmers, we propose, with the assistance of the members of the Agricultural Bureau, to get together as much information as possible on this important question. With this object in view, therefore, we would ask the members of the respective Branches of the Bureau to furnish information on the following points concerning any rust-resisting or rust-escaping wheats which they may have grown, or which their immediate neighbours, who are not members, may have cultivated:—

(1) Name of variety.
(2) Origin of variety.
(3) To what extent, and for how long grown.
(4) Character of straw, head, and grain.
(5) Whether early, midseason, or late in ripening.
(6) Yield as compared with the variety most generally grown in the district.
(7) Extent to which rust has been noticed on flag, or straw, and the effect, if any, on the grain.
(8) Whether rust-resisting, or only escaping damage owing to earliness, &c.
(9) Whether a good hay wheat.
(10) General remarks on suitability of the wheat for the district.

Where any reputed rust-resisting wheat grown by any member has been damaged by rust, it would be interesting to know under what conditions and to what extent the wheat suffered, as there is no doubt that these rust-resisting wheats are more suceptible of injury in some districts than in others. In reporting on this matter the experience during more than one season is desired.

We would be obliged if members would as soon as possible after harvest furnish to the respective hon. secretaries reports on this matter for consideration at the next meeting of the Branch, when a general expression of opinion on the merits of the respective varieties may be secured.

AGRICULTURAL BUREAU REPORTS.

Lipson, October 3.

Present—Messrs. Potter (chair), Swaffer, Brougham, Caleb and Charles Provis, Thorpe, Brown, France, Bratten, Baillie, Barraud (Hon. Sec.), and three visitors.

Red Rust.—Mr. Brown suggested that it would be a good plan if it could be arranged to insure the crops against damage by rust.

Agricultural College.—The Hon. Secretary reported on visit to Agricultural College. He was pleased with the farm stock generally, and particularly with the dairy herd. He considered the Jersey-Ayrshire cross the best he had seen for dairy purposes. The quantity of seed used on the College farm surprised him. He was sure it cost the College this year more per acre for seed alone than it cost farmers in this district for seed and manure.

Thatching Haystacks.—Discussion took place on enquiry as to best cover for a haystack. Mr. Brown's experience was in favour of thatching grass, while Mr. Swaffer found the tops of the broom bush very useful. Mr. Caleb Provis stated [illegible] in thatching he fixed the first layer firmly at the eaves, then simply [illegible] the rest of the thatch on carefully, except the top layer, which was [illegible] secured.

Yorketown, September 19.

Present—Messrs. Lloyd (chair), Koth, Anderson, Bull, Jung, Corlett, and Newbold (Hon. Sec.).

Membership of Branches.—Considerable discussion on this subject took place. Mr. Corlett suggested that one-third of the members should retire each year, but be eligible for renomination, together with others desirous of becoming members, the election being by ballot amongst the remaining members. The first two years they would have to ballot as to who should retire; after that the members would take it in regular turn. He thought the adoption of this system would make the Bureau less exclusive, and give a greater number a chance to avail themselves of the privileges of membership. It would also serve to eliminate the careless members. Members unanimously favour the adoption of Mr. Corlett's suggestion, and desire to know if any Branch could adopt such a rule if the members desire it. [Provided all the members agree, I see no objection to the proposal being tested by any Branch. It would probably be better to draw lots at first to decide who shall retire. - Ed.]

Balaklava, September 26.

Present—Messrs. Anderson (chair), Burden, Hams, Johnson, Reid, Thompson, Thomas, Black (Hon. Sec.), and about thirty visitors.

Castrating Horses. This meeting was held at Mr. S. S. Ralli's Werocata Station, for the purpose of witnessing demonstrations by Mr. Ralli in castrating colts standing. Two horses, aged 7 years and 8 years respectively were operated on most successfully; they were haltered and blindfolded, and a twitch placed over the upper jaw and held; another assistant held the tail tightly over on the side opposite to that operated on, and then with an ordinary sharp pocket knife the operation was performed. The only other implement used was one to grip the artery to stop the bleeding; after the parts had been bathed with a disinfectant, the horse was let go, and after two or three days' spell was all right. A hearty vote of thanks was accorded to Mr. Ralli for his kindness in inviting the members to witness the operation. The visitors afterwards made a careful inspection of the garden, woolsheds, piggeries, and other matters of interest.

Eudunda, September 28.

Present—Messrs. Gosling (chair), Weil, von Bertouch, Kluske, Schiller, Walter, and Marshall (Hon. Sec.).

Salt Patches.—Mr. T. R. Bowman wrote in reference to the treatment of salt soils. Many years' experience had taught him that the only remedy that could be reasonably applied was to plough the patches up several times, leaving the ground as rough as possible to allow the sun and air to play on the soil and also to break the capillary action which was the cause of the salt and magnesia being brought to the surface. On hard clay ground it will be found beneficial to apply a dressing of sand to the salt patches. A vote of thanks was accorded to Mr. Bowman for his kindness in writing to the Branch on the subject.

Annual Report.—The secretary presented the thirteenth annual report of the Branch. Messrs. A. E. Gosling, J. von Bertouch, and W. H. Marshall were re-elected Chairman, Vice-Chairman, and Hon. Secretary respectively.

Adulteration of Chaff.—Delegates reported on proceedings of Congress. A resolution was carried endorsing the recommendation that legislation should be enacted to prevent the fraudulent sale of chaffed straw as hay chaff.

Lipson, September 5.

Present—Messrs. Potter (chair), France, McCallum, Thorpe, Bratten, Carr, and two visitors.

Guinea Grass.—Newspaper reports on this subject were discussed. Members thought the grass a very valuable one, and worth trying in this district.

Barley Smut.—Mr. Carr reported having tried the hot water treatment for barley, but the seed all failed to germinate. Members thought Mr. Carr had used too hot water.

Minlaton, September 20.

Present—Messrs. Correll (chair). Anderson, Martin Brown, and J. McKenzie (Hon. Sec.).

Weeds.—The Chairman called attention to the spread of the common field poppy in this district, and to the necessity for dealing with it.

Horse Dentistry.—Some discussion on this subject took place. Several members reported that their horses were better able to chew their food since their teeth had been attended to, but one member could see no benefit from the operation.

Analyses of Fertilisers.—Members thought the results of analyses of samples taken by the Inspector of Fertilisers should be published as early as possible in The Journal. [We do this already, this year the analyses were published in the April issue, and as very few samples can be obtained before the middle of February any list published in the March issue would be very incomplete.—Ed.]

Hay.—Mr. A. McKenzie read a paper on this subject. Land intended for haygrowing should be cleared of all rubbish, and should be as even on the surface as possible, to save wear and breakages of machinery and loss of hay. To prevent the land getting ridgy and uneven he would plough in strips 10 chains to 15 chains in width instead of the usual narrow lands. If the land has been fallowed, run the cultivator and harrows over it before drilling in the seed. If at all lumpy, roll instead of harrowing, as the roller will smooth the surface, enabling the drill to deposit the seed and manure more evenly. The best time to cut hay was when the grain is just full, and before it sets or the straw loses its green colour. It was better to cut a little earlier, especially if the crop is dirty, than to let the crop get too ripe. With loose hay, if the weather is fine, rake and stook close up to the mower. Large stooks not only keep the colour and substance of the hay, but also are less liable to be blown about than are small stooks. Sometimes, however, no matter how well put together, the stooks get blown about and wet. It not wet, he would not bother to restook, but would cart and stack the hay as quickly as possible as soon as the weather suits. Wet stooks he would not turn, but if the ground is very wet would lift the edges of the stook with a fork to allow the air in. This would prevent the hay from sticking to the ground or becoming fusty. Stack loose hay as soon as it is dry enough to keep. In building keep the middle well up and as hard as possible, or the stack will slip. A good way to keep the middle up is to put in a few posts, standing about 2 ft. 6 in. above ground, along the middle of where the stack is to be built, and put good strong beams on the top. Pack the hay well under the beams, and then build over them to give a rise in the middle. Some draw their stacks and keep them hard and straight all round as they build, but there were two objections to this practice. First, it makes too much work; secondly, there is too much short broken hay round the stack. He believed in as little drawing as possible till the stack was built; then generally combed down the roof first, as the eaves could be raised or lowered a few inches as might be desirable. As soon as the stack is well raked and drawn weight it down to make it set hard for thatching. Sheaved hay was undoubtedly better than loose hay. It was cleaner, easier to cart and stack, especially in windy weather; it cuts better, and looks better as chaff. Where there is a considerable area to cut, it was necessary to start early or the crop will get too ripe before it can be all cut. In all cases stook well up to the binder; if the crop is green and the weather cool, make long narrow stooks, similar in shape to the roof of a house, with an air passage through the middle; if this is done the sheaves will dry all right. If the crop is riper and the weather fine make large round stooks and keep right up to the binder. If it looks like raining it will pay to stop the binder and put all hands on to finish stooking. Good stooking is a matter of considerable importance; if not fairly balanced they will mostly blow over, and the hay be more or less damaged He would sooner pay wages to a good stooker, than have a bad stooker working for nothing. Early in the season three weeks should be allowed to elapse between cutting and stacking, but a ripe crop cut in warm weather could be stacked within a week. He would put in 9 in. to 12 in. of timber as a foundation for the stack; mallee stumps closely packed and covered with a little straw make a good bottom. Begin stacking in the middle, and cover the foundation with sheaves set on end, these will flatten out sufficiently to build on, and will give the required rise in the middle of the stack, which must be maintained throughout. He preferred round or oblong ends to square corners. Sheaved hay should be thatched as soon as possible. In cutting chaff he found it best to cut dry, and a ¼-in. cut was about as good as any. Some preferred longer, others shorter, and many held that unless damped the hay would not cut well. As far as crops for hay were concerned, he found Cape, Dun, Algerian, and Champion oats, and Medea, King's Early, Ward's Prolific, Purple Straw, and Dart's Imperial all made good hay or chaff if the crops are clean and healthy and harvested and stacked in good condition. For his own horses he did not wish any better hay than a mixture of equal parts wheat and oats sown together. Of course, it was necessary to choose varieties which matured about the same time. Most of the members agreed with the paper, but considered chaff cut to ⅜ or ¾ in. more suitable for farm use than if cut shorter. Merchants preferred the shorter cut for convenience in bagging.

Gawler River, September 4.

Present—Messrs. Barrett (chair), Krieg, Leak, H. and F. Roediger, Bray (Hon Sec), and two visitors.

Fallowed Land.—The treatment of fallowed land was discussed. Members generally were of opinion that with land ploughed early in the winter it was wise to allow it to remain rough and open to permit the moisture to enter the soil, and also to secure the full benefit of atmospheric action. Land treated in this way would harrow down nicely in spring. In loose, marly land it might answer better to harrow immediately behind the plough, as such land usually required consolidating.

Ants.—In reply to question how to destroy red ants, Mr. H. Roediger stated that he got rid of them by sprinkling purple ant poison round the antholes. [London purple lightly sprinkled along the runs or holes will usually get rid of ants.—Ed.]

Richman's Creek, September 7.

Present—Messrs. Knauerhase (chair), Roberts, Mattner, J. H. and F. H. Lehmann.

Horses for Farm Work.—Discussion took place on the best class of horse to breed for farm work and general utility. Members favoured crossing a blood stallion with a draught mare for general purposes, but preferred the pure draught for wagon work.

Drift Sand.—In reply to question of best way to stop the sandy land drifting, one member stated that ploughing the land would be effective. Members would like to know what could be sown on the land after ploughing to bind it [This will depend largely upon local conditions If the land is ploughed early and sown to rye, a fairly good growth should be secured, if the rye stubble is left to stand or simply rolled it will help to prevent the soil moving, and also afford shelter to the natural herbage that would spring. Seeds of useful native shrubs and grasses should also be sown, and the land only lightly grazed. This, of course, only applies to land not intended for cultivation.—Ed.]

Denial Bay, September 26.

Present—Messrs. Smith (chair), McKenzie, Dunnet, Lowe, Starling, Dr. Bruehl, G. J. and W. O. Gale (Hon. Sec.), and three visitors.

Officers.—This being the inaugural meeting of the Branch, Messrs. J. H. Smith, W. McKenzie, and W. O. Gale were elected Chairman, Vice-Chairman, and Hon. Secretary respectively.

Red Rust.—Considerable discussion took place on this subject, various opinions being hazarded to account for the rapid spread of the disease under certain conditions. Mr. McKenzie suggested that the prevalence this year was largely due to the summer rains having started self-sown wheat and other plants, on which the rust has carried over until the wheat crop was advanced; then with favourable weather it had attacked and spread rapidly through the crops. He had noticed rust worst when they got a rank growth of wheat and warm, moist weather; these conditions appeared favourable to the development of rust. The Hon. Secretary tabled four wheat plants from different parts of a paddock; those from rising ground were more affected by rust than those grown on the lower and more level portion. This was contrary to his experience in other districts, the crops on higher ground being as a rule freer from rust. Members generally thought that the older the district the more liable were the crops to rust. It was decided to ask that descriptions of the best rust-resistant wheats be published in The Journal. [This will be done if members of Branches co-operate to supply the necessary information.—Ed.] Members generally were of opinion that rusty hay was more or less injurious as horse feed.

Yankalilla, September 25.

Present—Messrs. Tonkin (chair), Crawford, Leverington, Stone, Heggaton, Lovelock, Putland, Dennis, Dr. Meickle, MacMillan (Hon. Sec.), and four visitors.

Bovine Tuberculosis.—Dr. Meickle read an interesting paper on "Bovine tuberculosis." Contrary to the opinion recently expressed by Dr. Koch, Dr. Meickle is convinced that bovine tuberculosis is transmissible to human beings occasionally through the medium of badly cooked meat, but mainly through milk and dairy products He maintained that statistics supported him in such views. The spread of tuberculosis was attributed mainly to contagion and bad hygienic conditions, although inherited tendencies to the disease could not be overlooked. The diagnosis of the disease was simple in some cases, difficult in others; he advocated the wider use of the tuberculin test, although he recognised that it could not lay claim to infallibility. He recommended the isolation of all suspicious cases, the destruction of manifestly tubercular animals, and the improvement of the hygienic conditions that generally surround the dairy herd. Following on his assumption that bovine tuberculosis is transmissible to human beings, he proceeded to show to what extent carelessness and neglect may prove sources of danger to those who consume milk. The milk from one tubercular cow would generally be mixed with that of healthy animals, and when distributed from a central dairy would contaminate the milk consumed by a large number of persons. Most people rely upon boiling as means of freeing milk from the presence of possible tubercle bacilli. Dr. Meickle points out that whilst the sterilization of milk by means of heat is possible in the laboratory, it is rarely effectively reached by the prefunctory boiling that usually obtains in the ordinary household. But even if milk were effectively purified, what about butter? According to Dr. Meickle, therefore, war against the bacillus must be conducted mainly in the dairy and cowsheds.

Arthurton, October 1.

Present—Messrs. Hawke (chair), Rowe, S. T. and T. Lamshed, Northy, Welch, [illegible], Lomman, and Palm (Hon. Sec.).

Warts on Horses.—Delegates reported on proceedings of Annual Congress, and [illegible] were criticised. For warts on horses, Mr. Welch said he found [illegible] application of treacle effective.

Lucindale, October 3.

Present—Messrs. Feuerheerdt (chair), Tavender, Carmichael, Dow, McInnes, Matheson, and Dutton (Hon. Sec.).

Co-operation.—Considerable discussion took place on paper read at previous meeting by Mr. Tavender on this subject. Members generally agreed with the principles of co-operation, but were afraid the suggestion for local residents to buy out the storekeeper and run the store on co-operative lines would hardly work. The Hon. Secretary thought that though the scheme looked all right, jealousies would soon creep into it if it were put into practice; the right directors might not be elected, or the manager would not please every one. The Branch had had a little experience in co-operation in the matter of their bull; all the cowkeepers wanted him when feed was plentiful, but no one would take him when he required feeding and attention. Mr. Tavender read letters from several different parts of the State in reference to his suggestion. Mr. Campbell, of Millicent, who was formerly a storekeeper, wrote heartily approving of the principles of the paper; but he thought they would find storekeeping a very complex business, and on a moderate scale an expensive method of distribution. He favoured keeping only samples at the agency, and buying things as wanted from the city bulk stores until they could work with other centres in running true co-operative stores, as was done by the Wholesale Co-operative Society of England.

Gladstone, October 3.

Present Messrs. Sargent (chair) Rundle, Gallasch, Goode, Burton, McDonald, Smith, and Wornum (Hon. Sec.).

Northern Conference.—Members desire that the Annual Conference of Northern Branches be held at Gladstone next year.

Horsebreeding.—Mr. Wornum read a short paper on breeding and handling horses. He thought it would pay farmers to give more attention to the breeding of horses. They had an unrivalled climate for horsebreeding, and good, saleable stock fetched remunerative prices Doubtless the present high prices were partly due to the fact that owing to the low prices prevailing some years ago many farmers gave up horsebreeding, and good horses were consequently scarce. He would use only the best mares for breeding, and take care that the stallion had a good show of blood. Breeding from pure-bred stock was more satisfactory than from indiscriminate crosses. Though the Clydesdale held first place for heavy work, it was probable the Suffolk Punch, a powerfully built, active horse, would be better adapted for farm work. It was also claimed that if crossed with the thoroughbred mare a good roadster would be the result, but he doubted its possessing sufficient trotting powers. The strict roadster, viz., the cross between draught mare and blood horse, possesses the same objection, and besides there is the difficulty in getting the right proportions of both. The roadster bred to type was a different animal; its best pace was a trot, and it could be fairly regarded as a distinct breed. It was a very useful horse for crossing with heavier or lighter mares as the occasion may require. Good carriage horses could be raised by first crossing blood mares with a draught horse and breeding the fillies to a roadster. He liked to start handling the foals as early as possible, to get them quiet and used to being led without a halter if necessary. The foal should be weaned at about six months old, and fed well for the first year. Break in at about three years old, and be careful not to overwork it. Slow horses should not be worked with extra free movers. Take care the animal is properly mouthed, and teach it to tie up. The collars must not be too large; if the horse has sore shoulders, cut away the collar to relieve the pressure on the sore. Keep the collar and the shoulders clean. Unless the horses were overheated and the water very cold he would let them drink freely immediately after working. Keep them in good condition, and allow them a few weeks' spell before harvest commences. He thought that as a rule they did not give their horses enough oats, which were the best of food for working stock.

Ensilage.—Mr. D. D. Smith read a paper on silos and ensilage. Local circumstances must determine what materials can be most economically utilized

Mount Pleasant, October 9.

Present—Messrs Phillis (chair), Lyddon, Drogemuller, and Naismith.

Poultry—A short discussion on this subject took place

Season—Members reported that takeall and grubs had done some damage to the crops. Grass was plentiful, stock doing well, and there was every indication of a good season for stock

Millicent, October 1.

Present—Messrs McRostie (chair), Harris Hutchesson, Oberlander, Mutton, Varcoe, Campbell, Stewart, Hart, and Davidson (Hon Sec)

Sore Teats—Mr Davidson read a short paper on this subject There are various remedies given for curing sore and damaged teats. He had noticed boric acid mentioned as good, and having experimented with it found it a capital remedy. Of course, boric acid is an anti-irritant as well as an anti-septic, and as a sanitary measure for washing the cow's teats and milker's hands it cannot be beaten Scabs warts and other troubles are often transferred from the teats to the milker's hands, hence a preventive is necessary When the cows teats are washed daily before and after milking with a solution of boric acid all soreness chaps, &c. will disappear in a few days As there were a few cows in every herd that suffered from sore teats, and consequently made things uncomfortably lively at milking time it is well worth trying Warts on the teats are another source of trouble They can generally be removed by an application of castor oil, once daily, which is preferable to use of scissors Another simple and good application consists of a mixture of fresh butter two parts and very fine pulverized salt one part mix thoroughly and apply to warts after milking Mr Varcoe had been using Condy's fluid and found it very effective Members generally agreed that the use of this article was worthy of extension for all purposes of disinfection

Harlequin Bug—In reply to enquiry for remedy for the harlequin or soldier bug, Mr Hart found it a good practice to keep fowls and ducks in the garden, other members referred to success obtained by placing old bones in a tin or box to attract the beetles, and then destroying them by pouring boiling water over them Mr Mutton had little trouble with this insect since he cut down some native gums where they seemed to shelter and breed, he considered the scalding process too tedious

Manures—Some discussion on the value of crude guano and Thomas phosphate took place

Co-operation—Mr Campbell read a paper on "A successful Co-operative Experiment," and considerable discussion ensued The question of the saving that could be effected by the farmers in any district combining to get their manure in large parcels was referred to It was stated that last season a number of farmers, who secured between them about 70 tons of manure, saved altogether about 7/6 per ton Mr Campbell said in some quarters farmers appeared to favour starting local co-operative stores, from his experience as a storekeeper he would say that this was the last thing farmers should touch.

Onetree Hill, October 2.

Present—Messrs J Bowman (chair), F Bowman, Ifould, Kelly, Smith, Clucas (Hon. Sec.), and three visitors

Annual Report.—The secretary's report showed an average attendance of 7.3 members during the past year Officers were thanked and re-elected.

Congress.—Delegates reported on proceedings of Congress Members were generally in accord with opinions expressed in reference to failure of travelling entires, but also thought that in many instances the owner of the mare should be held responsible for the failure

Watervale, October 5.

Present—Messrs. C. A. Sobels (chair), Beck, Holder, Ashton, Scovell, Treloar, Hunter, E. E. Sobels, Perrin, Solly, Smith, Croft, E. W. and O. H. Castine (Hon. Sec.).

Business.—On the suggestion of the secretary it was decided that members take it in turn to prepare papers for meeting, lots being drawn to decide the order in which members were to take their turn. Delegates to Congress reported on proceedings, and tabled copies of the papers read.

Season.—Members reported splendid show of blossom generally, and early fruit setting well. Apricots are inclined to be scabby, notwithstanding two applications of Bordeaux mixture. Spraying for codlin moth will be fairly general shortly in this district.

Lucerne.—Mr. Ashton tabled splendid sample of lucerne from seed sown during the first week of August; 10 lb. of seed and 1 cwt. of manure per acre were drilled in.

Scales Bay, October 3.

Present—Messrs. Roberts (chair), Plush, Newbold, and Thomas (Hon .Sec.).

Feeding Horses.—Considerable discussion on this subject took place. The Chairman would give long hay at night, and chaff mixed with crushed corn and pollard in the daytime. Oats and barley were better than wheat, and the only objection he had to them was that the seeds got into the wheat lands. He advised farmers to conserve all the suitable feed they could get; they should have two good chaff sheds, and always keep one full as a reserve. They would find it a good plan to put up a few high posts, enclose them with netting, and fill up with wheat chaff, then cover with straw. This entails extra labour, but it paid better than letting the straw waste. Mr. Plush thought all farmers should sow, say, 20 acres of oats or barley for horsefeed. He favoured barley and oats for this purpose because the straw was better forage than wheat straw. He tried to grow some linseed several times, but without success. Mr. Newbold had seen wheat chaff saved in large quantities with but little trouble. The chaff was carefully built up in a large heap to a pyramid shape, and then thatched from the bottom upwards with teatree brush, a covering of straw being also added. This plan was very effective where large quantities of chaff were on hand and the time at the farmer's disposal was limited.

Weeds.—Mr. Plush had found a patch of sorrel on his land; this had been burnt, and while the centre was killed the weed was growing on the outside. [Keep the land cultivated during the summer and apply a good dressing of quicklime to the patch.—Ed.] Members complained that the common poppy was becoming a nuisance.

Whyte-Yarcowie, October 17.

Present—Messrs. Hack (chair), Hunt, Dowd, Makin, Mudge, Lock, Kornetzki, Faul, Francis, Mitchell, and Boerke (Hon. Sec.).

Ice Plant.—Members of this Branch are opposed to the suggestion to have this plant declared a noxious weed.

Experiments.—This meeting took the form of an inspection of various farms in the district. Smart's Early Wheat was far the best on all the farms visited, Dart's Imperial coming next. A few farmers have tried Rerraf, but it is by no means promising. No diseases were noticeable, and it was estimated that the district promised an average yield of 12 bushels per acre. It was noticed that the heavier the dressings of manure the better the crop, the wheat being stronger, heads larger, flag longer, and the plant had stooled better. It was also noticed that on the land more heavily manured the flag was already withered nearly half-way up the stalk, the flag on the unmanured crops being quite green. Members wished to know whether this was due to the manure.

Mundoora, October 9.

Present—Messrs. Harris (chair), Blake, Tonkin, Shearer, Loveridge, Mitchell, Mildren, Angley, Allen, and Gardiner (Hon. Sec.).

Prizes for Wheat.—Members were pleased to learn that the Royal Agricultural Society was going to offer prizes at the March Show for the best sample of wheat exhibited by any Branch of the Agricultural Bureau, and might much good would result.

Red Rust.—Members report rust to be found in most crops, but there were several rust-resisting varieties grown in the district which were practically free, and others only lightly affected. The Hon. Secretary suggested that members should note the wheats which resisted rust best and bring them before the next meeting. The Hon. Secretary stated that he had a few acres of crop badly affected by black rust and would like to know cause; the land was fallowed and manured with 56 lb super per acre.

Virginia, October 5.

Present—Messrs. Hatcher (chair), J. E. and S. J. Taylor, Nash, White, Maloney, J. E. and D. J. Sheedy, Huxtable, Strempel, Thompson, Odgers, Johns, Ryan (Hon. Sec.), and three visitors.

Sheep on the Farm.—Mr. Ryan read a paper on this subject. Every farmer should keep a few sheep, as there is always a certain amount of food suitable for sheep that would otherwise be wasted. He would prefer breeding lambs for the export trade as there seemed a certain market in England for unlimited quantities of lambs at a profitable price. Even at a considerable reduction in present prices there would be a profit, while with lower prices they would naturally expect a greater demand in London. If they were buying ewes in a season like the present he would advise purchasing at once more than they required, as it was impossible to pick and choose now. They could then cull out all that did not suit and sell them as fats later on. He favoured the large framed merino ewe, a four-tooth for preference. The merinos were quieter and less likely to wander away than either longwools or crossbred. In buying a ram he advised securing a couple of good lamb rams from a large breeder. He had adopted this practice with very satisfactory results. For a farmer with only a few sheep he was almost inclined to say feed more than breed required special attention. They must on no account overstock. Two ewes well fed will be more profitable than four half-starved. If they found as the season advanced that they had more feed than required, they should buy a few wethers and use them to keep down the weeds on the fallow. In this direction alone sheep were worth a lot on the farm, as they saved a lot of labour scarifying or harrowing. These sheep must not, of course, be left on the fallows too long, as to get the best returns they should be fattened as quickly as possible and sold as soon as fit or loss will result. The use of fertilisers had made a vast improvement in the grazing capacity of the land in this district. Land that formerly would hardly keep a goat will now carry two or three sheep to the acre for several months. It was advisable to have the land divided into a number of small paddocks; not only does it permit a frequent change, but the stock can be kept in front of the plough, and after harvest put in the paddocks before the food was spoilt. Any farmer keeping sheep should put 10 to 15 acres into rape about the end of January, selecting the first paddock cut for hay and on which the sheep have been running. This will ensure early feed for the lambs coming in about the beginning of April. Unless there is good early feed provided it was, however, a great mistake to have the ewes lambing too early. He did not see why if they grew feed for them they could not have two crops of lambs each year. Lucerne would be particularly valuable. With hay at 25/ per ton and wheat 2/6 per bushel they should convert some of the crops into a more marketable product, and at present nothing looked more promising than the frozen meat trade.

Black Rust.—Some discussion on this subject took place, there being a difference of opinion as to what black rust really was.

Pyap, October 7.

Present—Messrs. Rogers (chair), Billett, Holt, Robinson, and Cox (Hon. Sec.).

Season.—Caterpillars were reported to be attacking the vines in places. The use of the Paris green, bran, and sugar mixture was advised. Members report crops generally look well, though the rainfall for the nine months has only totalled seven inches. Red rust is prevalent on the higher parts where the land is stiff; members thought this partly due to the fact that this land retained the moisture on the surface longer than sandy soil. Feed is plentiful, and stock fat.

Holder, October 10.

Present.—Messrs. Rowe (chair), Perry, Tuck, Star, Burrows, Phillips, Pickering, Green (Hon. Sec.), and two visitors.

Green Manuring.—Mr. Phillips reported that last season a neighbour ploughed up a patch of ground thickly covered with the prickly weed known locally as "roly-poly." On this land he had a splendid crop compared with the crop on clean land alongside. Grubs were reported to be very numerous among the vines, being worst in the cleanest parts of the orchard.

Currants.—Discussion took place on paper by Professor Perkins in Journal of Agriculture on "Ringing currant vines." It was decided to carry out some experiments in this direction during the coming season.

Gawler River, October 2.

Present—Messrs. Parker (chair), Leak, Barrett, Day, Hillier, Winckel, Krieg, Badman, F. and H. Roediger, and visitors.

Homestead Meeting.—Members met at residence of Mr. H Roediger and made a tour of inspection of the farm. Among various matters of interest the dairy and milking shed, the latter with a gangway through the middle with all facilities for feeding, were first noticed. Experiment with crops for green feed were mentioned, and Mr. Roediger stated that he found barley preferable to oats or rye; lucerne had done remarkably well on irrigated flats, eight cuts each about two feet in height having been taken during one season. The vegetable and fruit garden contained a complete assortment of plants for production of home requirements. Members and friends were afterwards entertained by Mr. and Mrs. Roediger.

Poisoning Ants.—Mr. J. Badman stated that he found London Purple effective for poisoning ants.

Shows. Mr. Badman initiated a discussion on shows. He thought it would be a splendid plan if it could be arranged that all the first-prize sires at country shows be exhibited at the Royal Show. Country shows should not be held within 20 miles of one another, and the first prizewinner at one show should be debarred from competing at others except in the championship class. A resolution agreeing with Mr. Badman's ideas was carried.

Wandearah, October 5.

Present—Messrs. E. H. Eagle (chair), Wall, Munday, Fuller, W. and R. Roberts, Davidson, Halliday, and E. J. Eagle (Hon. Sec.).

Northern Conference.—This Branch favours holding the annual conference at Crystal Brook.

Improvement of Wheats.—Mr.. Fuller initiated a discussion on the improvement of wheats by cross breeding, and referred particularly to Mr. R. Marshall's work in this matter. Some members thought this work should be carried on by the Professor of Agriculture, others thought it hardly came within the scope of his duties. It was, however, resolved to suggest to Professor Towar that if possible he should give some attention to the matter, as it was of the greatest importance to agriculturists.

Morphett Vale, October 20.

Present—Messrs. Bain (chair), Forsyth, Depledge, F. and A. C. Pocock, Anderson (Hon. Sec.), and one visitor.

Apple Growing.—Mr. A. C. Pocock reported on visit to Cherry Gardens Conference, and an interesting discussion on apple growing took place.

Horsebreeding.—Mr. Forsyth read a paper on "How to breed a pair of carriage horses." There might be some question as to what a carriage horse really is, but, after all, the range is not a wide one when consideration is given to the fact that breeders must aim at producing the horse for which the demand is constant and the price best. There were five points to be touched on in stating what should be aimed at; these are height, build, colour, action, and temper. As to height, an average of 16 hands is undoubtedly best, and as they could not breed to an inch in height, anything from 15.2 hands to 16.2 hands will be found readily saleable. While there is a good market for matched cobs of 15 hands to 15.2 hands, the demand was not so regular nor price so high as for carriage pairs. It was a common saying that a good horse cannot be of bad colour, but be this as it may, a bad coloured animal can never be classed as a good carriage horse. True, some people will pay a good price for a well-matched pair of uncommonly coloured horses, but such are bad to match and bad to sell when matched, while for a whole coloured horse, be it bay, brown, or black, buyers are always to be found. Some may object to black, but no pair of horses will sell more readily than a clean-cut, highbred pair of whole blacks. To many this demand for special colours may appear absurd and contrary to commonsense, but when breeding carriage horses fashion will rule, and the breeder must follow the demand. Little need be said as to build as there can be practically no difference of opinion. Whatever may be said of the hackney, there was no horse built on better lines for carriage work, and the breeder that can come up to the type of the "up to date" hackney will find buyers waiting for him. Now, in regard to action, in his opinion they could not have too much action, all other things being right. He had never known a well-matched pair to be rejected on account of too much action; in fact, every inch above normal the horse goes, the higher the price. It is objected that high action is no good on the road, but often the graceful, elastic movement of a high-actioned horse is less trying than those without action at all, besides which, if high action is demanded the breeder must go with the fashion. Temper is also of the utmost importance. A carriage horse is usually well fed and underworked, it has to stand in busy streets, at shop doors, and other crowded places, and any defect in temper will render it unfit for its work. Every attention should be paid by the breeder to this matter. His many years' experience had convinced him that there was the greatest tendency to this vice becoming inherent, and he would strongly advise that whatever type of horse is aimed at, neither mares nor sires which display inherent vice should be bred from. He was a strong advocate for showing stallions in harness at the various shows though it might not be possible to do so at Adelaide. It seemed absurd to expect to be able to judge whether a horse was suitable for breeding certain classes of horses unless he was seen at the class of work required of his progeny.

Ringing Currants.—Notes by Professor Perkins in October issue of Journal were read and favourably criticised.

Wepowie, October 5.

Present—Messrs. Gray (chair), Gale, Fisher, Orrock, and Halliday (Hon. Sec.).

Congress.—Mr. Gray reported on proceedings of Annual Congress, and expressed the hope that in future the programme of subjects to be discussed would [illegible] forwarded to the delegates a week or so before they had to leave home. If this were done it would make the meetings more instructive as [illegible] would bring forward the results of any particular experiments they [illegible]ken.

Bute, October 6.

Present—Messrs. Trengove (chair), Sharman, McEvoy, Commons, Stevens, Hamdorf, Schroeter, and Masters (Hon. Sec.).

Congress.—Delegates to Congress reported at length on proceeding. Mr. Ifould's paper on "Fodder crops" was specially noticed, and also statement by Mr. Dawson that from 30 tons to 40 tons per acre of mangolds had been grown at the Burra. Members thought it would be well to try this and other crops mentioned. The delegates also thought that judging by the discussion on the question of the eradication of the ice plant it would be well for residents of this locality to take every precaution to prevent its introduction. The visit to the College was also referred to, and the crops and stock were favourably commented upon.

Hay.—Most of the members preferred to cut crops for hay when the bloom has just fallen, but Mr. Stevens liked it better when there was a little grain in it, as he thought the horses would do more work on it than on the same quantity of green hay.

White Heads.—Mr. McEvoy referred to losses through wheat going off in white heads. Members thought this was often due to attacks of white ants and sometimes to takeall.

Clare, October 2.

Present—Messrs. W. S. Birks (chair), Kelly, Christison, A. P. Birks, Hague, Bray, Dolan, Martin, and Greenway (Hon. Sec.).

The Currant Industry—Mr. J. T. Hague read a paper on "Currant growing and ringing." When he first started growing currants he followed the practices generally recommended, but up to the ninth year results were not satisfactory, never more than £10 per acre being realized. The poor returns appeared to him due to too vigorous growth, and consequent shedding of fruit about the end of December. He had heard of the Greek practice of "ringing" vines a number of years ago, but until Mr. Grasby wrote his report on his visit to Greece he had not understood exactly how and when to ring. Even then he was, owing to the different systems under which the vines were grown, somewhat afraid to try the practice. In Greece the vines were, he believed, planted 4 ft. x 4 ft., and trained on the gooseberry bush principle, in South Australia they were planted from 15 ft. to even 40 ft. apart and trellised. Starting as an experiment by making a single cut round the stems of a number of vines he had varying results. Some vines bore splendid bunches of large plump berries, others had a fair crop, but the most vigorous vines bore practically nothing. This was five years ago, and as he noticed then that where a wire was tied tightly round a rod there was a good setting of fruit, he decided to try this method the following year. An acre or two of vines were so treated, the wire being put above the second bud on each rod. Owing to frosts most of the vines failed to bear, but the only ones to carry any crop at all were those that were wired. He found, however, that many of the rods did not swell enough, while others grew over the wire and then blew off; in December he had to go over the vines and remove the wires. Being dissatisfied with these experiments he decided to ring the vines for all they were worth; three seasons ago 8½ acres were treated, and a return of 35 cwt. per acre of dried fruit obtained; mould was the cause of loss of at least 5 cwt. per acre. The vigour of the vines was, however, severely checked, and the increase in size during the past three seasons has been very little, if any. He had carried out experiments on 1½ acres, trying different methods, and found that anything which gave the vines a slight check just before or during flowering made the fruit set well. The wider the strip of bark removed, the larger the fruit and the less colour in it; the fruit also took longer to ripen, and was not so sweet nor so well flavoured as that from the untreated vines. As a rule the treated vines are two or three weeks later in ripening their fruit; the canes on these vines are very brittle, and the vine itself is easily broken off at the stem. He also found that the rows of untreated vines on the flat yielded just double those on the hillside, while topping during flowering increased the yield by 35 per cent. on the hillside rows, and 25 per cent. on the flat. A single or double cut without removing any bark doubled the yield on both hillside and the flat vines, and the fruit ripened at usual time; it was well-coloured and of good flavour, though not so large as fruit from the "ringed" vines. The fruit from vines on the hillside treated in this way gave 40 lb. more dried fruit to the ton of green fruit than did either "ringed" or untreated vines. The "topped" vines, however, did better still, giving 80 lb. more of the cured article to every ton of green fruit. Ring barking increased the yield on the flat to the extent of about 50 per cent., and on the hillside to fully 150 per cent.; ringing had a far better result on vines on dry ground and on weakly vines that would otherwise have borne scarcely any fruit. The following season only half the vineyard was "ringed," the other vines receiving a single cut and the strong growths being topped. The yield from the latter was only about one-half of that of the "ringed" vines, and he was forced to the conclusion that having started "ringing" it would be necessary to keep up the practice. Last season all but one row on the hillside was so treated; this row bore only one-sixth of the weight of fruit yielded by the rows on either side. He had noticed a report from the British Consul at Patras, in which it was stated that the ringbarked vines would only last 30 years to 40 years; he doubted whether in South Australia their trellised vines would last as long, especially on the drier soils. The system which recommended itself to him as the best for ordinary land was the Bordelais spalier, with a trellis of one wire about 2 ft. from the ground The rods should be rung, and replaced by fresh rods each year This would give a longer life to the vines than the present system of training as cordons, pruning to spurs, and "ringing" the main stem. On rich, wet flats use a high trellis of two wires, training alternate vines to the top wire, and spur pruning all of them. He doubted the wisdom of "ringing" vines on such land, as the fruit is very inferior, and does not ripen properly. Good returns can be obtained by making a single cut round the stem and nipping back the shoots during flowering. Where "ringing" is practised it will not be necessary to plant more than 10 ft. apart, and well-grown vines can be made to give splendid returns at four years. In reference to the prospects of the industry, they had the benefit of a protective duty of 2d. per lb., and taking the yield as high as 1 ton of currants per acre, there was considerable room for expansion They could not, however, hope to do anything with outside markets, as the Greek currants were sold at a price they could not touch.

Morchard, October 10.

Present—Messrs. Scriven (chair), Toop, Kupke, Graham, O'Loughlin, McDougall, Kitto, Forbes, Reichstein, Beck (Hon. Sec.), and two visitors.

Minimum Selling Price for Grain—Mr. Kitto read newspaper extract, which stated that 38,000 farmers in the United States were organizing with a view to securing a union of wheatgrowers throughout the whole world, the object being to fix a minimum selling price for grain. All members of this Branch are in hearty sympathy with this movement, as the farmers have practically no voice at present in respect to the selling price of their produce. It was decided to ask the Secretary for Agriculture to obtain all information possible from Canada concerning this matter.

Black Rust.—Many members report some of their crops badly affected by this disease, the early sown crops being worst. Several members had noted that where black rust was prevalent there was little, if any, smut. [This disease is due to a distinct fungus, but we know of no preventive action that can be taken.—Ed.]

Strathalbyn, October 19.

Present—Messrs. M. Rankine (chair), Sissons, Watt, Reid, Blake, Cockburn, Cleriton (Hon. Sec.), and one visitor.

Congress.—Papers read at Annual Congress were discussed. Members were favourably impressed with Mr. Ifould's paper on fodder crops, which they consider contains many valuable suggestions. Paper on rearing horses on small farms and Professor Towar's address were also appreciated. It was agreed to discuss Mr. Thomson's paper at next meeting.

Balaklava, October 10

Present—Messrs. Manley (chair), Anderson, Neville, Reid, Smith, Thompson, Thomas, and Black (Hon. Sec.).

Straw.—Discussion took place on the value of straw, members being unanimous in advocating the saving of stacks of straw this season for use when other feed is scarce. Some of the members thought it a good plan to build straw stacks in the stubble paddocks as shelters for stock, besides affording them a picking later on in the year.

Delegates reported on proceedings of Congress.

Clarendon, October 12.

Present—Messrs. Juers (chair), J. and W. Spencer, Pilling, Harper, Piggott, Hilton, Morphett, Phelps Wright (Hon. Sec.), and two visitors.

Cherry Gardens Conference.—Messrs Phelps and Wright reported on proceedings of Conference of Hills Branches. One member wished to know whether the members thought the producers derived any real good from these meetings. The two members present at Cherry Gardens considered that the meetings this year were very instructive, and if producers would study the report carefully and follow up the suggestions made they would benefit materially.

Moth Plague.—Considerable discussion took place in reference to the enormous quantities of moths about this year. Members feared this indicated serious trouble with caterpillars in the immediate future.

Cape Tulip.—The secretary reported that the weed previously exhibited by him had been identified as the Cape tulip. Mr. Spencer stated that the previous week he was on a farm where 11 horses had died as a result of eating this weed. He strongly urged every one in the district to destroy the weed before it spread too far

Longwood (Mylor), October 3.

Present—Messrs. W. Nicholls (chair), J. Nicholls, Vogel, Smith, Hemer, Cheeseman, Hayley, Bradley, Oinn, Nielson, Hughes (Hon. Sec.), and six visitors.

Journal of Agriculture.—This meeting was devoted mainly to criticism of items of local interest referred to in three previous issues of The Journal.

Sore Shoulders.—Members do not like the idea of putting wet collars on horses, even for light work, with the object of shaping them to fit the horse's shoulders. They advised taking care always to use the same collar for the same horse, and not using it on another animal. They found the treatment that would cure sore shoulders on one animal would not have the desired effect on another. Amongst various remedies suggested, in addition to keeping the shoulders clean by bathing with warm soapy water, were equal parts carbolic oil and glycerine at first, but using less carbolic as the sore heals; sprinkle sore two or three times daily with ground starch; dust with coal soot and lime.

Weedy Flavours in Milk.—Mr. Narroway recommended dissolving a small piece of saltpetre in warm water and putting it in the milkpan before pouring the milk in.

Black Spot on Potatoes.—Members have known second-crop potatoes affected by black or brown spot to become free from the disease if left in the ground for a short time longer than usual. This had been particularly noticed with Magnum Bonums.

Bloat or Hoven.—The following remedies have been successfully tested for blown cows:—Tie a stick about as thick as the wrist, but with a hole in it, in the cow's mouth to keep it wide open; insert a short length of ordinary india-rubber hose into the throat to facilitate the escape of wind.

Crystal Brook, October 3.

Present—Messrs. R. Pavy (chair), Townsend, Hutchison, G. and G. M. Davidson, W. and A. Hamlyn, Venning, Miell, Weston, P. Pavy, and Symons (Hon. Sec.).

Regulating Price of Wheat.—A letter was received concerning an organization of farmers for this purpose, but consideration was postponed until further information was available.

Ensilage.—Mr G. M. Davidson read a paper on this subject. In making a silo, one must study convenience for filling and emptying, and local conditions; these latter will also affect the decision as to the character of the silo. He thought a round silo best, as if underground the wall is self-supporting to a certain extent and may be lighter than with any other shaped pit A deep silo required less pressure than a shallow one, and also exposed a smaller surface to the air. Care, however, must be taken not to make it too deep The walls may be of stone, brick, or concrete according to cost, but in good, firm ground that does not become saturated with water it is not absolutely necessary to build any walls. Almost any green vegetation may be conserved as silage, but maize is generally considered best of all. The crop is usually cut just when full-grown, but this must vary according to the nature of the crop In filling the pit keep the materials level and well trodden down Providing that packing is done well, it is best to fill the pit rapidly Planks should be laid across the pit when full and weighted with heavy materials There was no doubt about the value of ensilage, more especially for dairy stock, and the practice of conserving fodder in this way warrants greater attention.

Port Pirie, October 3.

Present—Messrs. Johns (chair), Hannan, Crispin, Lawrie, Hector, Wilson (Hon Sec), and one visitor.

Short Weight in Binder Twine—Mr Crispin reported finding bundles of binder twine deficient to the extent of 2 lb each gross weight Members had not tested the weights of their purchases but would like members of other Branches to report on their experiences with a view to taking concerted action if there is any evidence of unfair competition in this way

Mount Gambier, October 10.

Present—Messrs Edwards (chair), Mitchell, Ruwoldt, Barrows, Pick, Norman, Wilson, and Lewis (Hon Sec)

Congress.—Delegates reported on proceedings of Congress Mr. Mitchell gave particulars of a visit paid to the north as far as Jamestown. He was particularly struck with the general use made of super, and the great benefit derived from the practice of fallowing Farming could be very cheaply carried on in these areas, and this year the crops were very promising. Mr Ruwoldt referred to various matters connected with the dairy industry.

Snails.—Reference was made to the enormous number of snails in the gardens and elsewhere this year Ducks were recommended as a remedy, but it was stated they soon got surfeited of snails and required other feeding.

Cherry Gardens, October 13.

Present—Messrs. C. Lewis (chair), J. Lewis, Jacobs, Hicks, Brumby, and Ricks, (Hon. Sec.).

Weeds.—Mr. Jacobs called attention to the spread of the bush known as the yellow broom, which would cause considerable loss to landowners unless [illegible] action was taken to keep it in check.

Mannum, October 19.

Present—Messrs. Faehrmann (chair), Schulze, Haby, Lenger, Wilhelm, Walker, and Richardson (Hon. Sec.).

Red Rust.—This fungus was stated to be spreading rapidly in some of the crops, while "take all" has affected many small patches of crop in different parts.

American Wheats.—Mr. Walker reported that those he had given seed of Argentine wheat for trial spoke favourably of it for hay. He also tabled samples of imported Red and White Walla Walla wheat, together with a sample of wheat grown locally from Manitoba seed.

Co-operation.—Mr. Wilhelm read a paper on "A farmer's dream of the future." Many papers had been written by members of the Agricultural Bureau dealing with the drift of the farming community to the towns, and suggestions have been made to improve the conditions surrounding farm life. Many useful ideas have been brought forward, but to his mind they all failed to get to the root of the evil, which was simply that the farmer, his wife, and family were overworked and underpaid He was obliged to sell everything at practically whatever price is offered him, but the price of all he buys is fixed by the seller. In his opinion the only remedy was a producers' co-operative union, which would include farmers, fruitgrowers, gardeners, pastoralists, &c. If all the producers of the Commonwealth were to unite they could fix all prices for produce, and buy or manufacture all their requirements, run their own factories, stores, mills, &c., establish banks and insurance companies, thereby saving most of the enormous expenses and profits made by the individuals who at present practically lived on the producer. The savings effected in purchases, and the extra prices received for their produce, would allow the growers to work shorter hours, live better, and enjoy the same privileges as other workers. Members generally agreed that even if all the producers in the Commonwealth were to unite they could not improve the prices of wheat and other commodities which had to be sold in England as the law of supply and demand must regulate the price in the open market.

Orroroo, October 16.

Present—Messrs Moody (chair), Brown, Lillecrapp, Robertson, Matthews, Copley, and Tapscott (Hon. Sec.).

Ice Plant.—The Hon. Secretary tabled specimen of this plant grown in the district. Members were opposed to the plant being declared a noxious weed as it is looked upon in this locality as a fodder plant, all kinds of stock eating it. [This is quite a different kind of plant to that known around Port Pirie as the "ice plant."—Ed.]

Kapunda, October 3.

Present—Messrs. Shannon (chair), Flavel, Banyer, Pat and Peter Kerin, Pascoe, Byrne, and Harris (Hon. Sec.).

Congress.—The Chairman reported at length on proceedings of Congress. The discussion on poultry showed the interest farmers were taking in the by-products of the farm. He thought that there was a great future before both poultry and pigs, and would like to see the Export Depot handle frozen pork The trouble at present was that at one time pigs fetched very high prices, while at others they were scarcely saleable. By developing an export trade prices would be more regular, and with the fall in wheat which was bound to take place after harvest he was sure it would pay farmers to utilise a portion of the crop for fattening pigs. The question of honorary membership was mentioned; members present generally favoured this proposal.

Weeds.—Mr. Flavel tabled specimens of Cape tulip and wild onion, which had become troublesome weeds in some parts. The Chairman said he heard that the wild mustard was very bad in the crops in the Redhill district, and advised farmers to be very careful where they procured their seed wheat.

Morgan, October 3.

Present—Messrs. Windebank (chair), Pope, Hahn, Wohling, and Plummer (Hon. Sec.).

Destruction of Mallee.—Mr. H. Hahn read a paper on "Is it wise to destroy the mallee in the dry areas?" This was a question which should be very seriously considered The mallee was a very hardy tree, growing in dense masses under conditions that give other timber no chance. It is mainly utilized for firewood, and the most general practice in this district was to set fire to the scrub on a hot, windy day. Once started it will burn in different directions, according to changes of wind, for perhaps weeks until it reaches the patchy or thinly-timbered country After a good burn, the woodcarter congratulates himself on having secured a good supply of dry wood to cut and cart later on. Most people will admit that this is a very wasteful practice, as all the hollow and mature mallee will be burnt, and this is the only portion of the mallee that is of any value at all for posts. Mallee forks and rails are very useful for sheds or stockyards. If the present wasteful methods continue it means that in about 10 years' time mallee will be double its present price or coal will have to take its place. The quantity of wood trucked annually between Eudunda and Morgan amounts to 50,000 tons or more, and this cannot possibly be kept up for long Under a reasonable system no shortage need be feared They had ample evidence of late year's that the rainfall was insufficient to make wheatgrowing reliable, and he was sure that eventually the land would be held in larger areas The mallee areas could, however, be profitably worked for timber. Given 1,000 acres of mallee, a man could cut over 50 acres each year, which would give 300 to 400 tons, and bring in £100, enough to keep the pot boiling, if the wheat crop fails At this rate it would take 20 years to get over the area, and by this time the portion first cut could be cut over again After cutting the timber the rubbish should be burnt, and for a year or two the land would produce good grass Two or three years later the shoots from the stumps should be thinned to from three to eight, according to the size and vigour of the stump, if this is not done, there will be too many shoots to make good firewood in the required time He was convinced it would pay better to use the mallee in this way than to destroy it as was now done.

Nantawarra, October 7.

Present—Messrs Dixon (chair), Sleep, Greenshields, E J and A F Herbert, Belling, Dall, R and J Nicholls, and one visitor.

Castrating Horses—Several members reported having witnessed a demonstration in castrating colts standing by Mr. S. S. Ralli at Werocata. They were much impressed with the advantages of this method

Death of Mare at Foaling—Mr. Belling reported loss of valuable mare At foaling time, the foal being dead and turned the wrong way, attempts were made to remove it, but it was found necessary to destroy the mare He had since been informed that had the foal been left for five or six days the foal would have decayed and come away Members would like to know what to do in such cases.

A Convenient Stable—Mr W J Dall read a paper on this subject No farm was complete without a good, warm, convenient stable They could not expect their horses to work properly unless well fed and comfortably housed On most farms a good stable can be erected at small cost Stone, both for building and for lime, is plentiful, and the cost would only be the labour for carting and burning the lime and for stones for the quoins. The removal of the stones would also improve the paddocks for working Select site for the stable as level as possible lengthways, a fall from the back to front is an advantage. Build the stable north and south; it affords protection against the cold winds and lets the morning sun into the stable. If the walls are built to a fair height he would have an iron roof; with low walls straw was to be preferred, as it was cooler. Make the stalls 5 ft. wide and not quite the length of a horse, the stall post to be just about the horse's hip. Leave about 6 ft. clear at rear of horses and pave the floor with stones. The short stall will be found more convenient and comfortable than a long one. To divide the stalls put a good stout rail about 4 ft. from the floor, and take it right to the back of the manger. One rail is sufficient, and there is no danger of the horses being injured, as they sometimes are by getting between the rails when there are two rails. Make a harness room in the centre of the stable for wagon, saddles, leading harness, &c.; the collar, hames, and winkers should hang on a peg in the post at the side of the horse. Make the manger of strong boards, and divide each stall into two parts, one for chaff and the other for hay. Arrange the manger so that one horse cannot interfere with the food of his neighbour. Make the manger 2 ft. 6 in. deep, 15 in. wide at bottom, and 3 ft. at top. Put eyebolt with ring in the centre of each stall. Care should be taken to fix tie ropes of the proper length; if this is done there will be no danger of the horses getting their legs over the rope, and if put in the manger when untied the rope will keep clean. It is much more convenient and safer to tie each horse up in its stall. A small yard should be made at the entrance of the stable; it should be wide enough to leave room for the manure heap and permit the horses to go to their stalls without walking in single file At each end of the stable build a shed, one for wheaten chaff and the other for hay chaff and the chaffcutter. The latter should have boarded floor; the former can be made of limestone. A passage 8 ft. wide should run from end to end at the back of the mangers, with a door into each chaffshed. Two openings should be left in the back wall of this passage to get the hay in should the stack be built at the back of the stable.

Wilson, October 3.

Present—Messrs. W. H. Neal (chair), Crossman, Coombs, Nelson, Need, W. H. Neal, jun., Smith (Hon. Sec.), and two visitors.

Congress Papers.—Delegates reported on proceedings of Congress. Mr. Coombs was pleased with Mr. Ifould's paper on fodder crops, and believed rape could be grown successfully in this locality. Since his return he had sown some on a plot of land that can be flooded; the plant is up and doing well. He believed they could also grow lucerne on those flooded plots Mr. Schubert's paper on horsebreeding was read and discussed. Members were of opinion that it would help to develop colts to break them in at two years and work them lightly, but too often even young horses when broken in are expected to do heavy work. A discussion on Mr. Thomson's paper also took place.

Willunga, October 3.

Present—Messrs. Pengilly (chair), Richards, Blacker, Malpas, W. and J. Binney, Kernich, and Hughes (Hon. Sec.).

Wheatgrowing.—Mr. W. Binney read a paper on wheatgrowing as applied to local conditions. It was absolutely necessary to fallow the land in order to get clean grain. For production of large plump grain of good colour, the land in this district could not be surpassed. There were a number of good wheats to chose from, but he had a strong preference for White Tuscan. It was a great cropper, stands the rough winds well, and produces a beautiful bright grain which in good seasons will weigh up to 66 lb. per bushel. Dart's Imperial and Marshall's No. 3 were also very suitable wheats for this locality, but with heavy winds they get knocked about and considerable loss ensues. His experience was that for their land Thomas phosphate was the best to use for the production of grain; it was slower in its action than super. but does not produce so much straw. He found that with mineral super there was too much growth of straw and a liability to blight with hot winds. He advised cutting a portion of the crop with the binder, and threshing with the header afterwards. This will enable the farmer to start harvesting a week or 10 days earlier, and give a supply of straw. The wheat cut with the binder should be stacked as soon as it is dry enough, as it will produce a better and brighter grain than if left longer. He found the present-day strippers cracked the grain badly, spoiling it for seed and also making it troublesome to get rid of the cracked grain unless a screen is used or a machine similar to the Canadian winnower shown at the Adelaide Show. When the grain is much cracked he advised putting a short screen in place of the one fixed in the winnower. This will enable the operator to blow the cracked grain over the top end of the screen, while the good grain will come down in front. Where larger areas of wheat are grown the harvester would probably be a good investment, as it does the work cheaply and produces a splendid clean sample with very little cracked grain in it. He thought they did not as a rule pay sufficient attention to cleaning their wheat. He was sure that it was to the farmer's advantage to have a good clean sample. Considerable discussion followed. Members agreed in placing White Tuscan first and Dart's Imperial second for grain for this district. Super was more generally used than Thomas prosphate here. Mr Binney said that during the past three years he had averaged 22 bushels, 30 bushels, and 25 bushels per acre respectively from White Tuscan wheat.

Reeves Plains, October 2.

Present—Messrs. Folland (chair), Winton, George, Worfel, Oliver, Richter, W. and W. H. Day (Hon. Sec.), and one visitor.

Licensing Stallion.—Mr. Worfel read a short paper on this subject. Horse-breeding was a profitable industry, and it was essential that only the best stallions should be used. It was a frequent occurrence for the farmer to keep a colt of no special merit to mate with his mares in order to save a few pounds, regardless of the type of the progeny or the trouble caused by the horse getting with the mares of neighbours who may be more particular about the class of stallion used. Many stallions travelling for hire possessed little if any pedigree, and no traces of good breeding; owing to cheapness these horses get a large number of mares, to the detriment of the stock and the owners of good horses. He thought that an annual licence fee or tax on stallions would result in a better class of horses being kept. A good discussion followed, but the majority of the members were opposed to the proposed tax on stallions.

Booleroo Centre, October 6.

Present—Messrs. Clack (chair), Murdoch, Nottle, Steven, Brooks, McMartin, (Hon. Sec.), and two visitors.

Northern Conference.—Members favour holding the Annual Conference of Northern Branches at Gladstone next year.

Congress.—Delegates reported on proceedings of Annual Congress. The Hon. Secretary referred to motion advocating grading of butter for export, and explained reasons for recommending this. Mr. Thomson's advice to cross the Shorthorn cow with Jersey bull did not meet with favour, members being of opinion that the Jersey-Ayrshire cross was better for this locality. The discussion on pickling seed wheat was referred to, the Chairman having advocated dissolving the bluestone in hot water. Several members mentioned that they always used cold water and found the pickle quite effective. The Chairman reported on visit to Roseworthy College.

Hartley, October 2.

Present—Messrs. W. Brook (chair), C. Brook, Pratt, Reimers, Stanton, Klenke, Kutzer, Jaensch, Wundersitz, Stein, Fry (Hon. Sec.), and two visitors.

Profitable Farming.—Discussion took place on how to make farming profitable. Members agreed that where the holdings were large enough it was profitable to combine cereal production with the keeping of sheep; neither paid by itself. It was unanimously agreed that the best way to make farming pay was to grow cereals and keep a few cows, horses, sheep, pigs, and fowls, keeping only good stock.

Appila-Yarrowie, October 3.

Present—Messrs. Keller (chair), Francis, Bottrall, Lawson, Fox, Hannagan, Stacey, Canning, Catford, and Bauer (Hon. Sec.).

Northern Conference.—Members favour holding Conference of Northern Branches at Gladstone next year.

Bureau Show.—A committee was appointed to make necessary arrangements in connection with annual show of products of the district to be held next February.

Haymaking.—In reply to question members generally favour cutting crops for hay when the grain is in the milk stage, or very shortly after.

Experiments.—Members inspected experimental plots at the public school, which have been looked after by the scholars under the supervision of Mr. A. Canning. The tests are confined to experiments with various manures for wheat crops.

Elbow Hill, October 6.

Present—Messrs. Hay (chair), W. and J. Ward, Pike, Wake, Dunn (Hon. Sec.), and six visitors.

Handling Young Horses.—Mr. J. Ward read a paper on this subject The horse requires educating when young, and he would commence handling it as early as possible. Tie the foal up carefully with a good rope when the mare is being worked instead of having it shut up in the shed. In breaking in the horse be careful that it is well mouthed; use a strong bridle, with the reins crossed above the neck, and fastened to a surcingle, and drawn tight Wherever it is to be worked it wants teaching, and a good reliable horse to work with it is a great help. Do not use the whip more than absolutely necessary. The horse must be made to obey, but there is no necessity to knock it about or frighten it. If the horse is properly taught to stand over and to back there is no necessity for the farmer to kick it, and use strong language, as was sometimes done when harnessing. A stubborn horse requires the whip, but not too much of it. He thought it a mistake to work a horse before it is three years old, and then it should not be worked for more than half a day at a time until well used to it. Some difference of opinion existed as to the best way to mouth colts. Members as a rule make it a practice to work their young stock lightly from the time they are two years old. They believed in tying up the foal, and teaching it to lead as young as possible. One member stated that a horse of his had a growth on the upper part of the lip; the growth feels like a stone, or other hard substance, embedded beneath the skin. He wished to know whether it would be wise to lance it. It was stated that kerosine had been used as a cure for sand in horses Members wished to know whether it was advisable to give animals kerosine, and if it were likely to be effective in getting rid of sand. [The Chief Inspector of Stock states that it is impossible to say whether the hard growth referred to could be removed by a simple incision. It is possibly due to excess of lime in the drinking water. He cannot recommend the use of kerosine internally, although it is not infrequently given in small doses without any apparent ill-effect.—Ed.]

Amyton, October 8.

Present—Messrs. Thomas (chair), Mills, T. J. and W. Gum, Kelly, Gray, Mullet (Hon. Sec.), and seven visitors.

Horses.—By invitation of the branch, Rev. T. Weatherill attended, and read a paper on horse complaints and their treatment, dealing principally with disease of the respiratory organs Several members asked for treatment for horses suffering from colic or from sand, but Mr. Weatherill had no experience in the treatment of these complaints.

Port Elliot, October 17.

Present—Messrs. McLeod (chair), Nosworthy, Pannel, Williamson, W. E. and W. W. Hargreaves (Hon. Sec.).

Summer Fallow.—Mr. Williamson stated that a neighbour ploughed up during the summer portion of a paddock infested with sorrel, and the balance just before sowing. The hay crop on the summer fallow was quite a foot higher than on land alongside. Paper read at previous meeting by Mr. Basham on grazing and farming was discussed.

Seaweed as Manure.—Discussion on this subject took place. Mr. W. E. Hargreaves manured a small block with seaweed about four years ago, and ever since has grown better crops on it than land alongside manured each year with bonedust.

Poultry.—The Hon. Secretary read a paper on "Farm poultry." No farm was complete without a poultry yard, and the space allotted to it should be worthy of attention. No other class of farm stock will yield so great a return on the capital invested as will poultry properly managed. The farm is the best place for a first-class poultry yard, and farmers will find that there is money in pure-bred poultry. Many farmers' wives say that a mixed lot of fowls do better than pure breds, but he was certain that if they could have a nice flock of White Leghorns, Minorcas, or Wyandottes for 12 months, they would change their opinions. The farmer who takes up poultry as a source of income must have a direct aim in view. Is poultry for market the object, or is it eggs, or partly both? If the latter, he thought they could not do better than go in for Wyandottes and Minorcas. The former were excellent birds in every way; early layers, and good, heavy birds, and good mothers. The Plymouth Rock was also a first-class, all round bird. For eggs, they required good, hardy strains of egg-producers, but they would not get them in mixed breeds on the farm. A farmer's poultry yard should be made up of one egg-laying breed, and he thought there was nothing better than the White Leghorns. The egg business was capable of immense development; there was a very large market in London for eggs, and it was difficult to know why more attention was not given to it, especially in view of the small amount of capital involved. Dry, warm, well ventilated houses, regular attention, and cleanliness were essential to success. The farmer should decide what breed he intends to go in for, and stick to that, doing his best to build up the highest possible egg-laying capabilities. In every flock some hens will lay much better than others, these should be carefully watched for, and mated with a good cockerel If this is done it is reasonable to expect that the progeny will inherit the characteristics of the parents, and so the laying capabilities of the flock will increase There was more profit for the farmer in eggs than in table poultry; for the latter the Indian game crossed with Dorking, Wyandotte, or Plymouth Rock pullets will give every satisfaction The chicks grow rapidly, and make large heavy birds of good quality. Besides a variety of good food, which the farmer should grow for himself, fowls require plenty of pure water, grit, cut bone, and green feed. They must not be cooped up in a small, dirty pen, but in clean, comfortable yards, with a plentiful supply of litter for them to scratch in. Overstocking must be avoided.

Mallala, October 5.

Present—Messrs. McCabe (chair), Loller, Churches, East, W. and S Temby, Stephenson (Hon. Sec.) and one visitor.

Crops.—Members report crops generally very promising, but black rust is bad in patches. Some complaints about red rust have been made, but serious damage is not expected.

Pigkeeping.—Mr. W. R. Stephenson read Mr. Hughes' Congress paper on this subject. Mr. Loller also read a paper on the same question As there was a good deal of offal on the farm that could not otherwise be profitably utilized all farmers should keep pigs. Where a good portion of the wheat is stripped, or there are a few cows kept, he thought it would pay best to keep a few Berkshire sows for breeding, as the sows will cost but little for their keep, except when suckling their young. If there are three or four small paddocks of an acre each to run them on. On this acreage enough green feed to graze six or eight sows could be grown during the greater part of the year. Two paddocks should be sown to rape and mustard in March; the crop should be allowed to get fairly strong, and then the paddocks fed off in rotation. These two paddocks will carry the sows through most of the winter, and when finished they should be ploughed up again and sown with sorghum and Planters' Friend. The other two paddocks should be sown with a mixture of oats, wheat, and barley in April, and this will come in when the rape is finished. Where permanent water for irrigation is available lucerne should be sown, as it will prove invaluable for the sows when shut up to farrow, or with litters during the summer. He preferred sows with a good strain of Berkshire, and would mate these with a pure Berkshire boar. The progeny will make porkers at an early age, and for bacon for the farmer they cannot be beaten. In choosing the sow see that she is fairly roomy, but not sloppy in build, passably quiet, and with at least six teats on each side. As the boar is the most important member of the herd, the utmost care should be exercised in selecting him. See that he comes from a strain noted for getting shapely pigs, and good large litters. The sow must be kept well fed while she is suckling, as the milk supply must be kept up. The young pigs must be kept growing from the start if they are to pay. Where a separator is kept the skim milk will be found very useful, especially for the young pigs when weaning; if crushed corn is added it will help to fatten them quickly. It should always be fed in a sweet condition. Styes should be roomy, with good roof, and face east. The roof should be well up in front to let in plenty of sunlight, as the young pigs require plenty of sunshine, and the styes will keep drier and sweeter. The styes should always be kept clean, as the pigs do better, and are not naturally dirty animals, as many people appear to think.

Boothby, October 13.

Present—Messrs. Whyte (chair), Bradley, T. and D. Sims, Chaplin, Way, Foulds, Leonard, Carn, Turnbull, and about 50 visitors.

Homestead Meeting.—This meeting was held at the residence of Mr A. A. Turnbull for the purpose of inspecting the experimental wheat plots. Last year the Department of Agriculture supplied eight different varieties for trial; all seed was saved and sown again this year, 64 acres in all being occupied with the test plots The visitors were particularly impressed with the value of four of the earlier varieties, viz., Allora Gluyas' Early, Smart's Early, and Baker's Early, which they thought would be well suited to the district. The rest of the farm was also inspected, one of the paddocks carrying what is considered to be the best crop in the district. Mr. Turnbull explained his treatment of the land, and after the inspection entertained the visitors. This meeting was considered to be one of the most successful held in the district, the evening being spent in social pleasures

Wheats at the Adelaide Show —Members were much pleased to learn that prizes were to be offered at the Adelaide Show for exhibits of wheat by the Branches of the Agricultural Bureau It was decided that this Branch compete, and a committee was appointed to select the exhibit.

Dairying —Mr. T. Sims read a paper on the best breed of dairy cows. He described the characteristics of the various breeds of cattle, and stated that for an all-round breed the North Devon cow was unsurpassed. The most profitable cow for the farmer was the one that would return the most money, and this being so they must look for carcase as well as for milk. The purely dairy strains were too small to be of much value for beef, but the North Devon combined the two qualities to a greater degree than any other strain. They are large cattle, develop and fatten early, give a fair supply of rich milk, are suitable for hilly rough country, and if treated kindly, but firmly, they are extremely docile and intelligent. The bullocks make the best of workers, and the beef is of high quality. After the North Devon he would place the Holstein for all round purposes, though the question of feed and country must always be taken into consideration. In his opinion both these breeds will produce more milk from a given quantity of feed than either the Jersey or Ayrshire, and will at the same time give more beef.

Nitrogen.—Mr. Foulds read a paper on nitrogen. He pointed out that in the older agricultural countries nitrogen had to be applied to most of the crops at considerable expense. In South Australia they had a magnificent inheritance in the air. As far as it was possible to determine there seemed no doubt that under a proper system of cultivation the soil obtained all the nitrogen required from the air. Land fallowed early, and worked well, will obtain more nitrogen from the air than cloddy or lumpy land, and still more than will uncultivated soil. Every stroke of the cultivating implements given at the right time makes a gain in nitrogen, and it was therefore necessary for them to exercise considerable intelligence in their cultivating operations. He did not think South Australians properly appreciated their advantages in this respect. For the present season's crop the outlay for phosphatic fertilisers amounted to £200,000; if they had also to purchase nitrogen then it would more than double their outlay on manures, as nitrogen was far more expensive than phosphates.

Rainfall.—Members expressed dissatisfaction at the fact that the table of monthly rainfall records only showed that of Cowell for this district, which was far below the average of the surrounding country. They would like rainfall records from gauges away from the telegraph stations published. [We would be glad to publish other records if they were available, but it is only from telegraph stations that we can get the returns in time for publication.—Ed.] The rainfall recorded at Cleve for the nine months ending September 30 is 11.71 in. compared with 8 in. at Cowell.

DATES OF MEETINGS OF BRANCHES OF THE AGRICULTURAL BUREAU.

With a view of publishing in the "Journal" the dates of meetings of the branches of the Agricultural Bureau, Hon. Secretaries are requested to forward dates of their next meetings in time for publication

Branch	Date of Meeting	
	1903 Nov	1903 Dec
Amyton	5	–
Balaklava	14	12
Booleroo Centre	3	1
Bowhill	7	5
Brinkworth	6	4
Burra	13	11
Bute	3	—
Cherry Gardens	10	8
Clare	—	4
Clarendon	16	—
Colton	7	5
Crystal Brook	7	—
Elbow Hill	3	1
Eudunda	2	7
Finniss	2	7
Forest Range	5	3
Gawler River	—	4
Golden Grove	5	3
Hartley	—	4
Inkerman	3	—
Kanmantoo	6	4
Kapunda	7	5
Kingscote	9	14
Kingston	7	5
Koolunga	5	3
Maitland	7	5
Mallala	2	7
Mannum	21	19
Minlaton	21	26
Morphett Vale	17	—
Mount Remarkable	5	3
Nantawarra	4	2
Naracoorte	14	12
Norton's Summit	—	4
Onetree Hill	5	3
Orroroo	20	—
Penola	14	12
Petersburg	—	3
Pine Forest	3	1
Port Broughton	5	3
Port Elliot	21	19
Port Lincoln	20	18
Pyap	4	2
Reeves Plains	—	4
Rhine Villa	—	4
Scales Bay	7	—
Stansbury	—	5
Strathalbyn	16	21
Swan Reach	6	—
Virginia	2 & 30	—
Wandearah	1904 Jan 4	
Watervale	Nov. 2 & 30	Dec. —
Wepowie	4	—
Whyte-Yarcowie	21	19
Willunga	7	5
Wilmington	4	2
Yankalilla	Feb. 5, 1904	

VENTILATION OF FACTORIES AND WORKROOMS.

CONTRIBUTED BY THE CHIEF INSPECTOR OF FACTORIES

(Continued from page 216 and concluded.)

CONCLUSION.

In concluding the series of articles contributed by me to The Journal of Industry on the subject of ventilation in factories, &c., I desire to express my indebtedness to the gentlemen forming the committee from whose report the abstracts have been taken for valuable and instructive information.

I purpose also adding a few words on the subject of the requirements of the Factories Act and regulations in force in this State, and a brief outline of what, in my opinion, are a few of the best methods to adopt in complying with them.

Every workroom in a factory is required to be provided with outlet openings at the highest practicable point of the room, to facilitate the escape of vitiated air. These openings should be equal in area to not less than 12 square inches for each person employed, and should be reckoned exclusive of doors and windows, which for all practical purposes may be regarded as avenues for the inlet of fresh air and light. Partially opened windows should not be regarded as suitable outlets for the used-up air unless they open close up to the ceiling. Open windows are splendid inlets for fresh air, but they cannot obviously be regarded as inlets and outlets at the same time, hence the necessity for outlet openings at a higher point to permit the escape of the expanded air, which, being lighter than the incoming fresh air, is forced upwards by the latter, and if not permitted to escape as above indicated will gradually mix with and contaminate the incoming supply of fresh air and impede effective ventilation.

Many people place their whole dependence in doors, windows, and fireplaces as the sole means of ventilation of their workrooms. This is, in my opinion, a great mistake. Windows and doors cannot always be kept open, for the reason that at times they create most intolerable draughts, that may prove more injurious in their effects than the inhalation of the stagnant air. Fireplaces draw off air from the lower strata, where the air is purest, and, therefore do not meet the requirements of the laws of ventilation. As water will only drain out of a vessel when an opening is made at the lowest possible point, so, on the contrary, will vitiated expanded air only drain off when the opening is at the highest possible point; and, as one authority aptly puts it, even then has often to be coaxed out.

It is therefore necessary to provide openings for the escape of the contained air at or as near to the ceiling as possible, and such openings should be so distributed as to draw off the air from all parts of the room in such quantities that the whole may be changed in the proportion of from 2,000 to 3,000 cubic feet per hour for each person present.

The very best results are, in my opinion, secured by the use of louvres in the roof, which not only provide for the escape of air in an even and natural manner, but also provide for an equal distribution of light without shadows. Where this is not practicable, ceiling cones, connected with tubes of sufficient internal cross section, and leading through the roof to the outer air, are found very effective in drawing off the vitiated air from workrooms.

Air bricks are always more or less a sham and a delusion, for the reason that very little free air space is left in them, the so-called air brick being about one-fourth air space, and the other three-fourths solid brick or iron, as the case may be. All openings should be calculated exclusive of solid obstruction contained in the space intended for the passage of air, and should be sufficiently numerous not to create unpleasant draughts.

In large factories of more than one story in height, and partly enclosed by other buildings, the same method may be applied to the lower rooms by carrying the air tubes through rooms above to the outer air.

I attach the very greatest importance to the provision of openings for the escape of the vitiated air at the highest point attainable, for the reason that if this is properly attended to fresh air will gain admission to replace it.

through doors, windows, and [illegible] chinks, in sufficient quantity to meet all requirements.

Electric or other power-driven air propellers are of immense benefit in changing the air of workrooms if situated in exhaust tubes, or may be used for conveying fresh air into a room by affixing them in the inner ends of tubes which have their entrance openings in the outer air. I, however, attach very little importance to the naked fans which are to be seen in use in rooms during the hot weather, and which are at most merely churning the vitiated air of the room without exercising much influence in changing it.

The regulations provide that not less than 400 cubic feet of air space shall be provided for each person in a workroom, and this should, of course, be exclusive of all lumber, fixtures, &c.

JOHN BANNIGAN,
Chief Inspector of Factories.

INDUSTRY.

SUPPLIED BY THE DEPARTMENT OF INDUSTRY

Labor Bureau.

Number of persons registered and found employment by Government Departments and Private Employers from September 26 to October 27, 1908

Trade or Calling.	Number Registered		Number Employed
	Town	Country	
Laborers and youths	42	73	200
Masons and bricklayers	4	1	5
Carpenters ..	3	—	4
Painters ..	5	—	10
Blacksmiths and strikers	6	—	1
Boilermakers and assistants	1	—	5
Fitters and turners	6	1	8
Moulders ..	—	—	2
Brassfinisher ..	—	—	1
Tinsmith ..	—	—	1
Coppersmith	1	—	1
Fettler	1	—	—
Storeman ..	1	—	—
Wheelwright	—	1	—
Compositor	1	—	—
Youth messengers	4	—	1
Attendants ..	—	—	2
Apprentices	15	4	3
Cleaners ..	3	2	—
Porters and youth porters	10	5	2
Rivet boys ..	1	—	3
Totals ..	104	87	249

October 28, 1908. A. Richardson, Bureau Clerk.

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AND

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RUST-RESISTANT WHEATS.

The Department of Agriculture has been asked to prepare and issue a catalogue of the rust-resistant and rust escaping wheats grown in South Australia. Recognising the value that such a list of wheats would be to our farmers, we propose, with the assistance of the members of the Agricultural Bureau, to get together as much information as possible on this important question. With this object in view, therefore, we would ask the members of the respective Branches of the Bureau to furnish information on the following points concerning any rust resisting or rust-escaping wheats which they may have grown, or which their immediate neighbours, who are not members, may have cultivated —

(1) Name of variety
(2) Origin of variety
(3) To what extent, and for how long grown.
(4) Character of straw head, and grain
(5) Whether early, midseason, or late in ripening
(6) Yield as compared with the variety most generally grown in the district
(7) Extent to which rust has been noticed on flag, or straw, and the effect, if any, on the grain
(8) Whether rust-resisting, or only escaping damage owing to earliness, &c
(9) Whether a good hay wheat
(10) General remarks on suitability of the wheat for the district.

Where any reputed rust resisting wheat grown by any member has been damaged by rust, it would be interesting to know under what conditions and to what extent the wheat suffered, as there is no doubt that these rust-resisting wheats are more susceptible of injury in some districts than in others. In reporting on this matter the experience during more than one season is [illegible].

We would be obliged if members would as soon as possible after harvest furnish to the respective hon. secretaries reports on this matter for consideration at the next meeting of the Branch, when a general expression of opinion on the merits of the respective varieties may be secured.

VINE AND WINE STATISTICS.

By Arthur Perkins, Secretary for Agriculture.

In our last January issue I was able to give an account of the exports of wines and spirits during the first nine months of 1902. In the present number, through the courtesy of the State Collector of Customs, I am able to take up the subject with reference to 1903.

It cannot be said that the figures that are given below can be contemplated with anything like unmingled satisfaction. True, they point on the one hand to steady progress in the interstate and New Zealand trade, and in that of some of our minor outlets; but, on the other hand, they show a fall in exports to the United Kingdom so great as to have reduced our total exports by over 41 per cent. when compared with last year's figures. There is no business in the world that could afford to look upon such a position with equanimity; and, in the present instance, had we not the absolute certainty that there can be no permanency in a position that has been created by purely artificial means, we might have to concede that the interests of our wine trade have been seriously jeopardised during the present year. The secret history of the machinations that have resulted in this unfortunate position has yet to be written. In connection with our statistics it may, perhaps, prove advantageous to attempt its analysis.

Towards the end of last century extravagant ideas appear to have been held as to the immediate effect of the removal of the border duties on our interstate exports, but a little reflection would have shown that, although new markets were thrown open to us, wine is a commodity the demand for which has, in new communities that have previously been debarred from its use by high duties, at all times to be created by patient advertising. It was illogical, for instance, to suppose that we could within the early years of federation dispose of as much wine in Queensland or New South Wales as is disposed of at present in our own State. It is evident that the difficulties we experienced in the past in getting even local recognition for our wines were forgotten. And at the present day, when the interstate trade has within the first three years of free commercial intercourse increased by nearly 350 per cent., we are met with statements in the Press that the increase has not come up to expectations. One might well ask: What were these *expectations?* In brief, so rash were the earlier statements as to the possibilities before the wine trade that they succeeded in disturbing the serenity of some of our London buyers, their great native astuteness notwithstanding. It is an open secret that it is largely to them that we owed early in 1902 the now historical visit of a wine magnate travelling ostensibly for pleasure. The new markets that were to drain his well dammed up supplies were certainly there; yet it took but little of his shrewdness to discover that some years must elapse ere he need apprehend any shortage of supplies. The cellars of his customers were apparently well stocked, and on all sides he was offered probably more than he could conveniently handle. In fact, whilst attempting to close up an outlet that had become necessary to us, did he not in sorrowful tones inform us that he could not take all our wines? The interstate bogey having been temporarily disposed of, he felt at liberty to turn his attention to another enemy, nearer to hand and easier to deal with. The Government Depot had been poaching in his sacred preserves: at all costs it must be slain. The first move towards this end consisted in heavy local purchases, at as low a figure as possible, with a view to rendering possible his temporary withdrawal from the market during the ensuing year. The second consisted in a practical ultimatum to the growers that unless they killed the Depot he would not only withdraw from them the light of his countenance, but, what was more important, his custom. These tactics naturally resulted in a vigorous local campaign against the unfortunate Government institution that had practically saved the industry from retrogression in earlier times this, together with rumours industriously spread in London as to its approaching closure, succeeded in considerably hampering Depot operations. Meanwhile, as the Depot still showed some remaining sparks of vitality, the ostracism of South Australian wines was firmly maintained, and has resulted in a fall of our exports to the United Kingdom during the first nine months of 1903 from 542,046 gallons to 218,359 gallons!

Such is the position in its nakedness. It is not without elements of seriousness; but it is more easy to overrate than to underrate them. Fortunately for us, in the present instance, the stability of the wine industry in this State is in the hands of those who are above a hand-to-mouth existence. Their vast cellars may be temporarily full to overflowing: a check in the exports such as has been artificially contrived during the last twelve months can do little more than do away with one year's profits; and, in the consciousness that their day must inevitably come, this they can afford to forego. It would be idle to deny, however, that so notable a curtailment in the exports could pass over us without imposing its toll of suffering, and, unfortunately, as is the way of the world, it bears down heaviest where there is least power to resist it. The smaller cellars must dispose of their wine, for to them the profits of the year not infrequently represent daily bread; and the sellers of grapes are in a position still more awkward, should winemakers find themselves unable to absorb the available fruit. It is so essential to the future prosperity of the industry in the State that no growers should be in a position to say that they were unable to dispose of their fruit, that I will briefly endeavour to show that the present state of repletion of many of our cellars must inevitably be succeeded by a period of scarcity, against which it is the interest of every maker to provide.

At present, in normal years, we dispose satisfactorily of a quantity of wine equal to our average production of two and a half million gallons; at the same time we have to face a steady, if slow, increase in local consumption; a continuous increase in interstate exports, so that in all probability in ten years' time the latter will overshadow the exports to the United Kingdom; a slow increase in exports to New Zealand and other countries; and until recently a steady increase in the exports to the United Kingdom. Further, it is improbable that exports to the United Kingdom can be checked by over 50 per cent. for a twelvemonth without notably decreasing stocks available for the demands of a market that has been established at much cost, and which has hitherto been characterised by slow expansion.

The Depot has now passed into private hands, and we may anticipate that the new owners will soon be actively exploiting the local markets; nor is it possible to suppose that after twelve months' inaction other buyers can hold back much longer. We must remember, too, that the older Victorian vineyards are gradually disappearing before the phylloxera, and that as yet there is no sign of much replanting on American stock; nor is there likely to be for many years to come; neither on the London nor the local markets is Victorian competition to be feared; in fact, it is probable that we shall soon find ourselves supplying the demands that Victorian enterprise opened out in earlier years.

In brief it is morally certain that within a few months the export trade must resume its normal flow, perhaps with the added momentum of unnatural confinement; and, further, if in the future we are to be in a position to supply demands that are steadily being created, our present output must not only be maintained, but considerably increased. It is certain that the unpleasant incidents that have surrounded the wine industry during the past few months will deter newcomers from taking up vinegrowing for years to come. Is it not, in fact, on record that a wealthy landowner, after planting successfully over a hundred acres of vines in 1902, has since, in view of recent events, decided to abandon them completely? Grape buyers, therefore, owe it to those who grow the grapes for them that every effort be made to save any fruit from going to waste. If they cannot rise to the occasion it is inevitable that they will rue it in the future.

Without further comment I append in Table I. our exports in wines and spirits for the first nine months in 1903 side by side with those for a similar period in 1902.

TABLE I.

Exports of South Australian Wines and Brandies during first nine months of 1903, compared with those for a similar period in 1902

	Wines.		Spirits and Brandies.	
	1903. Gallons.	1902. Gallons.	1903. Gallons	1902. Gallons.
To New South Wales	64,324	48,726	13,138	11,642
Victoria	23,572	20,407	14,118	3,625
Queensland . .	22,086	20,305	1,897	568
Western Australia	13,421	10,871	1,874	2,078
Tasmania	4,439	5,993	283	342
Commonwealth	127,842	101,302	31,310	18,255
New Zealand	25,405	18,432	1,413	1,587
United Kingdom	218,359	542,046	350	1,186
Other countries	17,079	5,286	581	7
Total outside Commonwealth	260,843	565,764	2,344	2,780
Total exports	388,685	667,066	33,654	20,985

One additional remark on the rising importance of the interstate trade. If to the exports of wines we add the wines that the spirits represent, we reach a total which during the nine months exceeds in importance that of the exports to all other parts of the world. Much of the spirits exported are strong spirits for fortifying wines, each gallon representing roughly 10 gallons of wine, whilst a gallon of brandy would represent only five gallons. On the assumption that each gallon of spirit going to neighbouring States represented roughly seven gallons of wines distilled the total amount would be represented by 219,170 gallons, making a total of 347,012 gallons with the wine actually exported. Spirits exported to the United Kingdom and elsewhere would almost invariably be represented by brandies equivalent to five gallons of wine, so that the total amount of wines and brandies, reckoned all as wines, would not exceed during the first nine months of the present year 272,563 gallons, a total nearly 22 per cent. behind the interstate total.

* * * * *

Our exports of raisins and currants have not as yet attained much importance. The home market is still in a position to absorb the totality of our production in these lines. It may, however, be of interest to note that, these facts nowithstanding, there already exists an export trade, and it is from this point of view that the figures in Table II are given They represent the exports during the first nine months in 1903, compared with those for the whole of 1902.

TABLE II

Exports of South Australian Raisins and Currants during first nine months of 1903, compared with those during the whole of 1902

	Raisins		Currants	
	First nine months 1903	1902	First nine months 1903	1902
	lbs.	lbs	lbs	lbs
To New South Wales	162,085	155,890	19 969	27 475
Victoria	1,761	97,091	2,209	23,758
Queensland	69,439	122,194	2,470	616
Western Australia	48,597	95 788	56	—
Tasmania	1,358	--	—	—
Commonwealth	283,240	470,963	24,704	51,849
New Zealand	30,072	12,600		—
United Kingdom	—	—		—
Other countries	—	1,310	—	—
Total outside Commonwealth	30,072	13,910	-	—
Total exports	313,312	484,873	24,704	51,849

DEPARTMENT OF AGRICULTURE.

REMOVAL OF OFFICES.

The Offices of the Department of Agriculture are now situated in the Western Wing of the Jubilee Exhibition Building, North Terrace, Adelaide.

Members of the Agricultural Bureau are invited when in town to call at the Office. The Library of Agricultural Literature possessed by the Department can be consulted by anyone desirous of doing so during ordinary office hours.

SPRING AND SUMMER PRUNING OF DECIDUOUS FRUIT TREES.

By George Quinn, Horticultural Instructor.

(Continued from Page 236)

THE APPLE, PEAR, AND EUROPEAN PLUM.

When grown under the generous conditions of soil and climate which prevail in most of the fruit-producing districts of this State, those kinds of trees which fruit upon permanent spurs are rendered more profitable by consistent manipulation during the growing season. Every one who has tried by hard winter pruning to give trees of these kinds strong, shapely sets of main arms will have been confronted with the difficulty of dealing with an immense number of strong lateral shoots which grow with "broomlike" density. This is pretty well illustrated in the apple tree figured in Plate I. To suppress these shoots completely would leave those portions of the main branches from which they originate bare and unproductive in future years, as well as exposed to the dangers of sun scald in summer. To shorten them back towards the parent branch in winter would accentuate the evil, by causing their numbers to be multiplied during the following season of growth. By leaving them untouched the light is shut out of the body of the tree, and the lower buds at the base of each lateral remain undeveloped. At the same time those near its point tend to form into fruit buds, the produce of which bends the laterals into a confused mass, and spoils the general balance of the tree's crown.

The correction of this overcrowded condition is found in subduing the laterals, and transforming them into fruit-bearing spurs There are two methods by which this may be done. The first consists of completely fracturing the laterals and removing the severed portions. The second is found in applying a check in the form of partially fracturing the shoot and permitting the injured extremity to hang in a pendulous position until the winter pruning is performed, when, having served its purpose, it is removed.

The first method may be applied in spring, when the laterals are from six to eight inches in length, and brittle enough to be severed with the thumb and finger. They are usually pinched off above the fourth bud from the base. If this is done a strong growth will again arise from some of the buds on the stub, and these in turn must be fractured after midsummer. A more practicable method is found in fracturing the laterals at midsummer wherever they exceed four inches in length. In most cases the topmost bud on the stub alone will grow strongly as the summer proceeds, and this may either be again fractured in early autumn or cut back to its wrinkled base at the winter pruning. One or more of the other buds on the stub will in the meantime develop into short spurs, each carrying a rosette of leaves. Where there is much moisture in the soil and liberal cultivation is practised the former plan will give good results, but in positions where moisture is failing and cultivation lax the second fracturing will seldom be necessary. While this is being practised upon the laterals one of the shoots has been selected on each main branch as a leader, which shall continue the extension and shape of the tree. This leading shoot is not pruned during the period when vegetation is in progress, but is dealt with in winter only. It is then pruned to a length which is regulated by its stability and direction of growth.

Closer observation and knowledge of the locality are needed in connection with the successful application of the partial fracture To obtain the best results this must be performed at the time when the sap is receding. The buds upon the stub will then form the short spurs with rosettes of leaves, to which we have already alluded as the growth to be desired. If, however, it is performed too early in the autumn, the top bud on the stub usually grows strongly, while the others remain dormant. If, on the other hand, the partial fracture be applied too late in autumn, all of the buds upon the stub remain quiescent, and with the return of the warmth of spring these will grow as vigorously as those upon laterals pruned only in winter. A glance at Plates II. and III. will reveal one of the comparative disadvantages of the partial fracture viz., the great density of shade which the hanging shoots cast over the buds and spurs below. This is a very serious defect. The certainty with which buds upon the stubs of the completely fractured laterals start into growth also gives that method considerable preference, while the simplicity of the work does not call for skilled labour, close observation, or any previous knowledge of the climatic conditions which prevail in the locality. Plates IV. and V. represent two branches cut from a pear tree. The laterals of Fig. 1 in Plate V. being

Plate I.—Dense growth natural to winter-pruned apple trees.

Plate II.—This shows tree in Plate I after the lateral growths have been completely fractured

Plate III.—Apple tree, with lateral growths partially fractured.

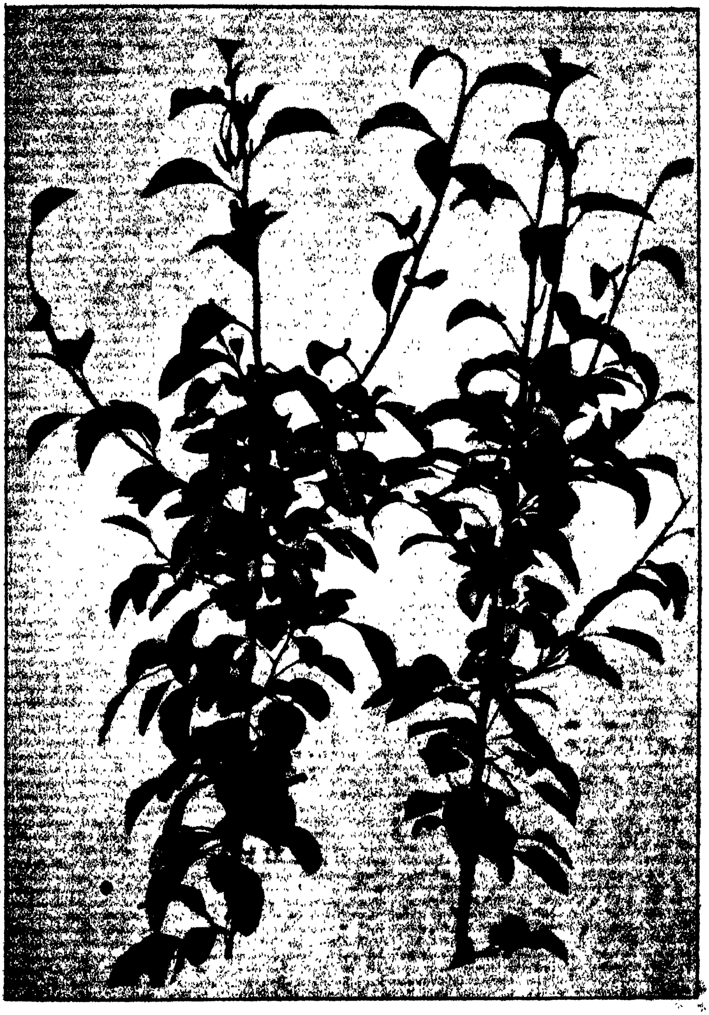

Fig. 1. Fig. 2.
Plate IV.—Pear branches, with lateral growths intact.

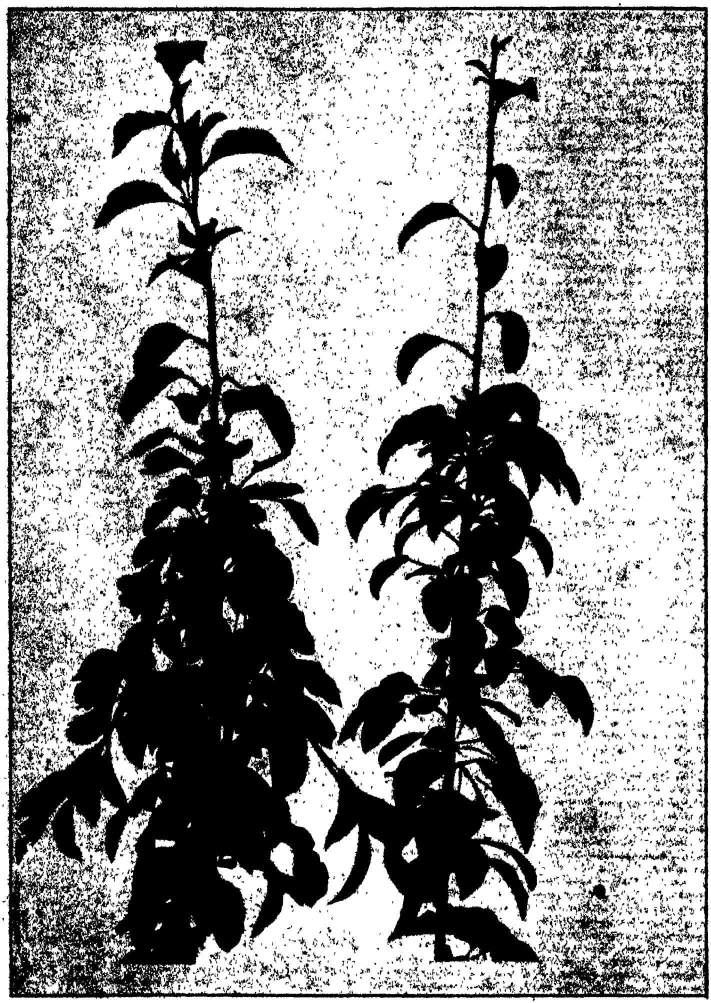

Fig. 1. Fig. 2.

Plate V.—Treatment of Pear laterals shown in Plate IV.

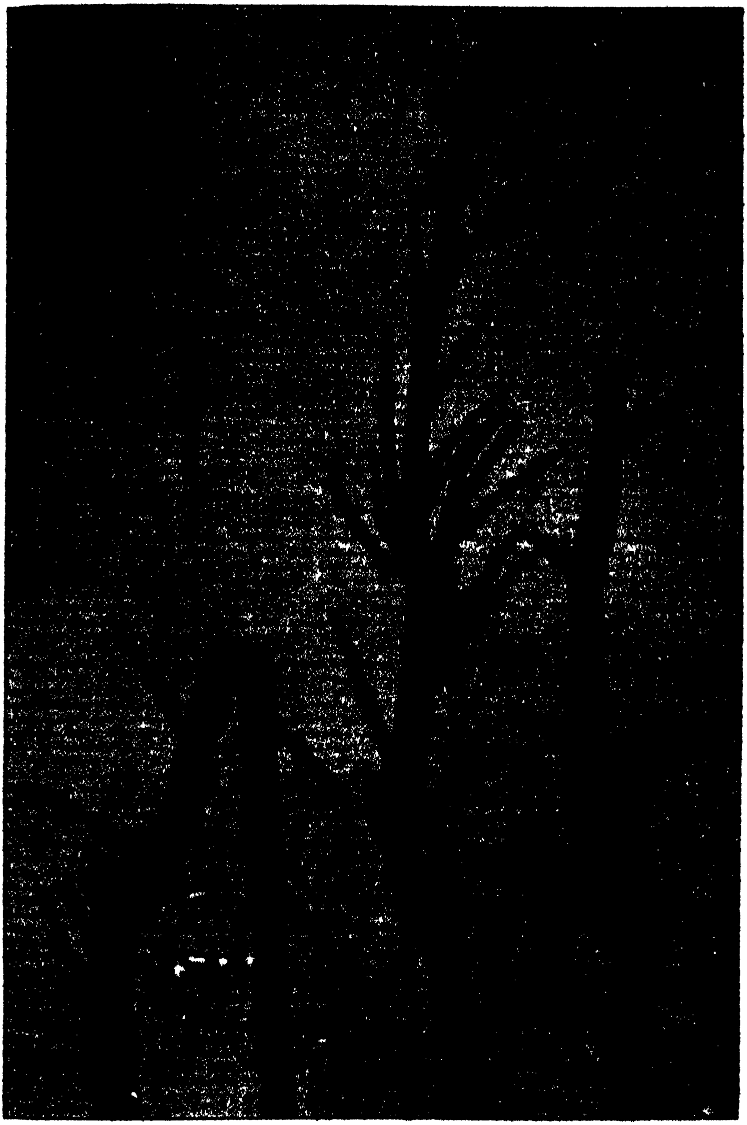

Fig. 1. Fig. 2. Fig. 3.

Plate VI.—Apple shoots subjected to the partial fracture.

subjected to the partial fracture, while Fig. 2 has had its laterals completely removed, thus allowing the sunlight to reach the lower buds freely, and, by hardening the bark, assist in restraining rank growth from them. In each case it will be noticed the leader has not been pruned.

The leaves have been stripped from the lateral growths of the apples photographed in Plate VI. The partial fracture is illustrated in Fig. 1. Fig. 2 illustrates the comparative development of the topmost and lower buds upon the stub. Fig. 3 conveys an idea of the great vigour of growth which often follows upon the stub of the partially fractured lateral when the operation is performed too early in summer. Plate VII. is the actual result obtained from the adoption of either method when successfully carried out. In practice the complete fracturing is best done with a pair of blunt or loosely adjusted pruning shears, because the bruised sections made by such an instrument heal slowly and appear to restrain the energies of the sap upon the buds retained on the stub. The leaves upon the stub should be carefully retained as far as practicable.

The partial fracture is quickly performed by pressing the lateral sideways over the blade of a pruning knife, which is also best suited to the work when slightly dull edged. The half-severed portion then hangs alive and capable of utilising a certain amount of surplus sap if the operation happens to be done a little too soon.

A word of warning is necessary in connection with the adoption of this practice. With the exception of those laterals which tend to crowd into the centre, or between the main branches of the tree, these weakening operations should not be applied to young trees of average growth until about the third season after planting. If a few outside laterals are permitted to grow they will help the tree to thoroughly establish itself. At a later period such shoots may be shortened back gradually towards their parent branches. In the second place—with the exception of occasionally pinching out the growing tip of a strong leader or side shoot arising from the main stem, for the purpose of balancing the crown of the tree, as outlined in a former portion of this article—no pruning should be applied during the season of active growth to any tree which lacks in vigour. (The specimens from which the accompanying illustrations have been drawn were obtained from the orchard of the Agricultural School in Adelaide.)

VII.—The ultimate result of a successful fracture.

REGULATIONS RELATING TO THE INTRODUCTION OF TREES, FRUITS, AND PLANTS.

The following regulations dealing with the importation of plants and fruits were recently gazetted in place of those gazetted on December 18, 1902:—

1. *(a)* The introduction into South Australia of grape vines and any portions thereof from any country or place is absolutely prohibited.

(b) Living trees, plants, or portions thereof (not being grape vines or portions thereof), and fruits (not being grapes) may be introduced into South Australia from any country or place under and subject to these regulations, but not otherwise.

(c) Living trees, plants, or portions thereof (not being fruit) shall only be introduced into South Australia at Port Adelaide by sea, or at Adelaide by parcels post, or at Adelaide by railway parcel under bond.

(d) All living trees, plants, or portions thereof, intended for introduction into South Australia, must, prior to being landed or introduced, be thoroughly cleansed of soil: Provided always that any inspector may admit plants growing in pots, if in his opinion there is no danger in importing them.

2. All living trees or plants, or portions thereof, or fruits introduced into South Australia from any country or place shall, on being landed or introduced, be forthwith delivered into the custody of some officer of Customs, and shall, at the expense of the importer or consignee thereof, be conveyed in original unopened packages to such place as the Commissioner shall direct.

3. An Inspector shall examine such trees, plants, or portions thereof, or fruits, and may treat such trees, plants, or portions thereof, or fruits in such manner as he may think desirable, or may order that such trees or plants, or portions thereof, or fruits, and the boxes or packages in which they were packed, or either of them, shall be destroyed by fire if, in his opinion, there is any danger in importing them.

4. The expense of conveying such trees, plants, portions thereof, or fruits to the place fixed for their examination, and of the examination and treatment or destruction thereof, shall be borne by the consignee or introducer thereof, and shall be paid before they are delivered to such consignee or introducer.

5. No person shall be entitled to any compensation by reason of any damage to or by the destruction of any tree, plant, portion thereof, or fruits, or of any box or package under these regulations.

6. No parcel of plants or portions thereof shall be introduced into South Australia from any country where the insect known as *phylloxera vastatrix* is known to exist unless accompanied by a declaration made by the grower before a Justice of the Peace or British Consular Agent in the State or country of origin, to the following effect —

(a) That the case contains no grape vines or portions thereof.

(b) That the plants were grown at a greater distance than fifty yards from any grape vines or roots of vines.

(c) That no phylloxera exists or has existed in the nursery or garden in which the plants have been growing.

(d) That the whole of the plants are free from the insect known as *phylloxera vastatrix*.

"TAKEALL" AND "WHITEHEADS" IN WHEAT CROPS.

By W. L. Summers, Inspector of Fertilisers.

Every farmer in South Australia has probably had more or less experience of losses caused by "takeall" and "whiteheads" in his wheat crops. In very many cases the losses have been of severe character. I doubt whether any subject has received greater attention from the members of the Agricultural Bureau than "takeall," unless it be the manuring of wheat crops. "Takeall" has been attributed by farmers to many different causes, and seems to occur under a great variety of circumstances. "Whiteheads" have usually been attributed to frost, hot winds, or sudden extremes of temperature. Up to the present, however, the cause of both has practically been shrouded in mystery, though there is little doubt that what has often been called "takeall" was simply rootfail, caused by a dry, hollow seedbed. Many years back some of our farmers noticed that "takeall" was worst on dry-worked land, and their intelligence led

SHEEP ON THE SMALL FARM.

By Dugout.

Most farmers now recognise that sheep on the farm are necessary to good husbandry; nevertheless, there still exist in our midst a good many small farmers who think they can do without sheep, and it is at these men that I am pointing the finger.

Sheep on the farm are as necessary as are children. The children do the odd jobs: run up the cows and horses, fetch the mail, and a host of other things that would not be done at all, or would not pay to do, if they had to be done by adults; so, in a different way, sheep supply the oddments on the farm; they provide the home with mutton when it is required. The average farmer who has not sheep may be seen wasting three or four hours a week driving away to some neighbours for a sheep, and generally winds up by falling out with a very decent neighbour because he has taken back a skin worth about eighteen pence instead of one worth five or six shillings, because he has dried it on a post and made it like a belltopper, instead of drying it on a rail and in the shade. Then there is the bit of wool, which will probably pay for the keep of the sheep, besides perhaps a little from the sale of what are not required after shearing, etc.

The breed of sheep must be fixed according to the part of the country you are in, but, generally speaking, the Merino should be the foundation stock, if not wholly Merino. Cleaning land and rearing fat lambs hardly go together; they may in good seasons, but if in average seasons you clean the land you don't fatten the lambs; or, on the other hand, if you fatten the lambs, you don't clean the land. For when you want to ripen up the lambs they should be hunting for green straws on the fallow, and wandering over fallow is not conducive to fat.

Generally speaking the man that has not had some knowledge of sheep has a very exalted idea of how many sheep he can keep, he seems to think they should be studded about the field like a good crop of melons on a pumpkin patch. The man who thinks he knows is worse than the one who knows he doesn't know. So if you have not had sheep before, and you imagine that you can keep 300, get 150, and you will be on the safe side. In a general way, it is not good business to buy old sheep; three young sheep can be kept where you could only keep two old ones. Old sheep often need nursing, young ones you can be offhand with; the latter will make a living almost anywhere and do the cleaning for you; the old ones can't do it properly. To the man who is new at the game, buying sheep is the worst and most difficult part of the whole business. Any mug can sell sheep, if they are of decent quality they will sell themselves. Buying is a different matter. If you don't know much about sheep ask some one else to act for you. Not the common gasbag that reckons he knows everything, but one of the sort that are rather diffident about giving an opinion. Some of these you will probably know. Tell one of them what you want and let him buy for you.

Shear your sheep just before the grass seed begins to shoot out of its stalk. It is better to shear a little early rather than be late with it. Fit shearing in between your fallowing and your haymaking. Don't be gulled by woolbrokers into making four classes out of six bales of wool, just take off the dirty edges, those small pieces that are about the armpits and the crutch; burrs don't count for much with buyers nowadays.

A last word of caution. I have some knowledge of what I am writing about, picked up principally from what I have seen others do. I have seen a good many brought nearly to ruin by buying too many sheep for the feed they had; so don't get more mouths than you can fill properly.

[We can commend to our readers our correspondent's rough-spoken wisdom. It appears to us, however, that his attitude, whilst certainly commendable to-day, may be in need of revision to-morrow, when sheep and livestock generally will no longer be looked upon as more or less necessary evils, fed on the natural herbage left along the fences and roadways, but will form the principal business of the farm, towards the wellbeing of which every farm operation will be directed. In such times it is not unlikely that sheep will be found "studded about the field like melons on a pumpkin patch."—Ed.]

EGG-LAYING COMPETITION AT MAGILL.

The following table shows the positions on November 28 of the pens of fowls taking part in the Royal Agricultural and Horticultural Society's competition at Magill, compared with the positions of the respective pens at the end of winter, i e , August 30 —

Position on Aug. 30	Position on Nov 28	Breed	Owner	Total Eggs laid to Nov 28
3	1	Silver Wyandotte	Sirgenfri Poultry Yard	699
2	2	Silver Wyandotte	Smith, W A E	696
5	3	White Leghorn	Crompton, F E	679
6	4	White Leghorn	Pauman, Messrs	660
8	5	White Leghorn	Von Bertouch, J.	642
4	6	Black Orpington	Keays & Tyler	640
1	7	Golden Wyandotte	Caterer, T A.	635
7	8	Silver Wyandotte	Bennett, H C	634
13	9	Andalusian	Evenden W F	584
9	10	Black Orpington	Child, W L	567
12	11	White Leghorn	Milford, W H	563
20	12	S S Hamburg	Kluge, J	561
16	13	White Leghorn	Bennett, W C	548
10	14	Brown Leghorn	Bevan, P P	540
11	15	Minorca	LeLievre Bros	539
18	16	Minorca	Hannaford, W	519
19	17	Houdan	Fleming, H	516
15	18	Golden Wyandotte	Mellor, P W	512
22	19	Minorca	Walker, G.	503
17	20	Brown Leghorn	Wright, C	497
14	21	Buff Orpington	Ucolta Poultry Yard	472
24	22	Minorca	Bower, J	400
25	23	Minorca	Mellor, J F	377
23	24	Black Orpington	Best Bros	374
21	25	Jubilee Orpington	Pugh, H M	326
26	26	Indian Game	Shierlaw, S B	201

It will be seen from the above that the positions of the respective pens have materially altered Mr Caterer's Golden Wyandottes have lost pride of place, and each week lately have been falling behind the leading competitors The Silver Wyandottes and White Leghorns have improved their position to a considerable extent, and the results point to a close finish between five leading pens for top place at the conclusion of the contest The positions occupied by the Orpington, Minorca, and Brown Leghorn pens will be a great disappointment to their supporters and their performances during the past three months do not hold out much hope for any material improvement

Taken altogether the birds in the contest cannot be said to have displayed any extraordinary egg-laying propensities There are six fowls in each pen, and the best average is only 116 5 eggs per hen for eight months, while only eight pens average over 100 eggs per hen The returns from the Hawkesbury competition are very much better than this

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ROSEWORTHY AGRICULTURAL COLLEGE NOTES.

FARM.

BY J. D. TOWAR, PRINCIPAL AGRICULTURAL COLLEGE.

HAY.—Cutting was completed early in November. Owing to the presence of red rust all the Dart's Imperial and Defiance at the "Island" had to be cut early. The rust was slow in attacking them, but when it did come it developed with marvellous rapidity. With four binders, however, we were able to cut it down quickly, and have made from these varieties a good amount of splendid hay. Over 300 tons of hay are now in the stack, and all was secured in excellent condition. Over half an inch of rain fell on November 15, and the stacks were wet to the depth of two sheaves. These were removed and stooked along the stack to dry. We estimate the yield at two tons per acre.

WHEAT.—A good portion of the wheat will be harvested with the strippers. This work was begun on November 19, on the Neumann's wheat at the "Island," and continued in the College Selection and King's at "Flett's." It is yet too early to estimate the yield, though, judging from results of a few crops in the neighbourhood, we are inclined to reduce our estimate by two or three bushels per acre. From a small patch of barley harvested in "Dahlitz" we secured at the rate of 48.2 bushels per acre. On November 3 the Sunshine and May Brothers' harvesters were tried in the College barley. As the trials were not of a competitive nature no results were recorded. The agents, however, very kindly explained to the students the working parts of their machines, and each machine gave a good exhibition of work in a somewhat heavy and difficult crop.

SHEEP.—The College Farm will this year breed 350 ewes, using two Dorset Horn, two Merino, one Shropshire, one Southdown, and one Lincoln ram. The Merino rams will have the best of the College Merino ewes, and the old Dorset Horn ram will be bred entirely to Merino ewes, while the 97 heavy crossbred and the remaining Merino ewes will be divided equally among the four coarse-woolled rams. Thus we will get a large variety of crosses, as well as some fairly high-grade Merinos. The rams were placed with the flocks on November 18, which is over two weeks earlier than last year, and the number of ewes bred will be double what it was last season.

EXPERIMENTAL VINEYARD.

BY H. E. LAFFER, SUPERINTENDENT OF VINEYARD.

November has been warm, with a couple of nice rains. These have kept the vines growing vigorously, and we may safely say that they never looked better. Apart from abundant growth, there is every prospect of a good crop of grapes, for the setting is very satisfactory. Carbenet especially shows a heavy crop, and this variety is closely followed by Malbec and Shiraz. Young vines planted to fill blanks are doing well.

The rainfall for the year up to date is only 15.33 inches. This is still below the average, but, having fallen at the most necessary times, the full benefit has been obtained by plants. Successive crops of wild melons and other summer weeds have been coming up, rendering constant scarifying necessary to keep them in check.

The necessary piping to irrigate the orchards has been put down, and the trees have had one good soaking. Though the ground was fairly moist underneath, yet for the sake of young trees, many of which looked rather sickly, we found it necessary to begin watering.

At the beginning of the month all currants were "ringbarked," the result being a heavy setting of fruit. Some experiments in waxing of incisions have been carried out. Every four consecutive vines in each row were treated as follows:—No. 1. Incision not waxed. No. 2. Incision waxed. No. 3. Incision bound with waxed cloth. No. 4. Incision waxed and then bound with waxed cloth. After three weeks, on examination, the following results were noticeable:—No. 1 was dry and bare, with the incision widening on account of drying of bark. Practically no callus was showing. No. 2 was better than No. 1, and showed a considerable amount of callus. No. 3. The incision was entirely filled with a ring of callus. No. 4. The same as No. 3. From this it may be concluded that the binding with waxed cloth is all that is necessary, there being no difference in those treated with both wax and waxed cloth. The waxed cloth is by far the more convenient method, there being no necessity of keeping a wax pot hot. These results have been obtained in three weeks, whereas some old scars which have been made two years have not healed yet. By getting this rapid healing of incisions much of the strain on the constitution of the vine will probably be done away with.

THE DISC PLOUGH.

By J. D. Towar, Principal Agricultural College.

A four-furrow disc plough (manufactured by W. C. Peacock & Brother, Melbourne) has been used for the past five years on the College Farm. It has done the bulk of the ploughing since it was purchased, having ploughed over 700 acres the past two years. Eight horses are used with it, each disc turning eight inches, and with this 32-inch sweep a good man is capable of doing 4½ acres a day, while about 4 acres is an average day's work.

Compared with a three-furrow stumpjumper, the disc plough runs relatively easier for depths of five inches and over. For shallower depths the difference would probably be less, although no tests have been made. The quality of the work done by the disc plough is better than that of any other plough on the farm. The furrow is completely turned over, and all coarse manure and herbage well covered. It is impossible to choke up in heavy stuff, as the revolving discs make a clean cut of all sod, roots, and vegetation, readily clear themselves, and leave a fairly even ploughed surface for the cultivation to follow. In soil liable to stick to the mouldboards the disc cleans itself perfectly, and even in the wet, sticky patches which sometimes occur in the field there is no difficulty in getting through.

It is true that we have not at the College one of the most improved stump-jumping ploughs, yet from our knowledge of what can be had in the market, were we to purchase another plough for our clean land we would get another disc. In hard ground the disc is not at its best, though it goes in readily in any land that is in proper condition for ploughing. In land stony or full of green stumps or roots the disc plough is not suitable, as the discs and other parts are liable to break, and large stones will throw the plough out of the ground. We have not tried the stump-jumping disc ploughs.

The construction of the disc plough involves a large number of wearing parts. There are three wheels, two of them set at an angle with the ground, besides the four revolving discs. A set of discs will plough, under ordinary conditions, about 200 acres of land, and with an enormous strain on the other wearing parts there is bound to be considerable expense for repairs, yet no greater than with the stumpjumpers. The plough has in general given satisfaction, and will continue to do the greater part of the College ploughing until replaced by something better.

HORSE-CLIPPING EXPERIMENT AT ROSEWORTHY AGRICULTURAL COLLEGE.

By J. D. Towar, Principal Agricultural College.

The experiment in clipping farm horses, which was begun early in the winter, gave on the whole rather indefinite results. The four horses which were clipped all seemed to do their work with less fatigue than their mates in full growth of hair, while in heavy work, when the unclipped horses were perspiring freely, the clipped horses kept perfectly dry.

Comparing individually the four clipped horses with those which worked in the same teams we offer the following notes:-

Clyde.—Large grey horse, aged. Poor in condition when clipped. Worked hard continuously, gained in flesh, and is now in better condition than at any time during the past year.

Cheviot.—Large brown horse, aged. Fair condition when clipped. Worked hard all through the winter, showed no signs of benefit from clipping.

Teviot.—Medium-sized grey mare, worked hard and continuously. Maintained excellent health, spirits, and condition throughout. No particular change.

Paul.—Large young horse, in good condition when clipped. Worked hard and continuously. Took slight cold and lost some condition.

On the whole, Clyde and Teviot seemed to improve by the operation, while Cheviot and Paul lost condition and showed no benefits. Unclipped horses working in the teams with the clipped horses showed similar gains and losses in weight and variations in condition.

The experiment on the whole leaves us with no definite results. There was the expense of clippers, rugs (which were used about four weeks), and the work of clipping, on the one hand, against horses working more easily, no sweat, and no grooming on the other hand. This year's result neither favours nor condemns the practice. We have no adequate measure of the benefits to offset the certain trouble and expense incurred in the work of clipping. The experiment merits another trial, and will probably be undertaken again next year.

AN ENQUIRY INTO SOUTH-EASTERN CONDITIONS.

By Arthur J. Perkins, Secretary for Agriculture

The South-East as a special Division adopted by the Statistical Department covers widely different areas from the South-East as defined by characteristic climatic and agricultural features. The former is made to include the Counties of Russell, Chandos, Buccleuch Cardwell, Buckingham, MacDonnell, Robe, and Grey, whilst at the very outside the latter cannot be said to include more than the Counties of MacDonnell, Robe, and Grey. Portion even of MacDonnell can hardly be said to be possessed of the true South-Eastern characteristics. For some time past I have contemplated an enquiry into the conditions governing the agriculture of the true South-East as above defined, and when in the course of these papers general reference is made to it, what is said should be connected exclusively with our three southernmost counties.

These three counties cover an area of nearly three and three-quarter million acres, distributed as follows.—

MacDonnell	1,180,800 acres
Robe	1,255,680 acres
Grey	1,308,160 acres
Area of South-Eastern Counties ...	3,744,640 acres

Of this area, in 1901, about one million acres had been wholly or conditionally alienated, whilst the total area in occupation, including Crown leases, was represented by over three and a third million acres, leaving only some 350,000 acres unoccupied. In these counties, therefore, in 1901 over 90 per cent of the land was being utilized in some way or other. This figure compares very favourably with what at the same period obtained over the rest of South Australia within the county boundaries. Over this more extended area slightly under 36 per cent. of the acreage was in occupation.

Opinions as to the economic value and future prospects of these three and one-third million acres are considerably at variance, and it is with a view to throwing some light on the matter that I have latterly contemplated a systematic investigation into the general conditions and soils of the counties. It is a matter of common knowledge that here, so far as quality of soil is concerned, extremes meet. We have on the one hand the exceptionally rich volcanic soil of Mount Gambier and the peat lands of Millicent; and on the other, vast tracts of white, sandy, bracken country, which could hardly be poorer. On the whole, therefore, it is not, perhaps, so much exceptional fertility of the soil that characterises the South-East as a reliable and fairly heavy rainfall. The latest mean rainfall map was issued by the Meteorological Department in 1895. In it MacDonnell is credited with a yearly mean of from 20 to 25 inches; the coastal half of Robe has a similar record, whilst over the inland half the mean varied from 25 to 30 inches; in Grey the general mean was given as 25 to 30, with the exception of an inner circle about 25 miles in diameter, and having its centre about eight miles east of Glencoe, over which the rainfall was given as 30 to 40 inches. The mean rainfalls that characterise our various settled districts are so much a matter of common knowledge that it is quite unnecessary to quote other figures with a view to setting out clearly the great advantages of the South-Eastern climate. We all know what a 25 to 30 inch rainfall means. It need only be added that owing to the lower temperature and consequent reduced evaporation that obtains in the country we are dealing with, in it 25 inches may be looked upon as more effective from the point of view of agriculture than a similar fall anywhere north of Adelaide, at Clare, for instance.

With the inevitable increase of population that is ahead of us, and the consequent and accompanying rise in land values that is equally and inevitably ahead of us, it is certain that the changes which characterised similar eras in European farming will be reproduced in our midst. And, as a natural consequence, there is much land both north and south of Adelaide that must in time drop out of the monotonous rotation of wheat and bare fallow To my mind it is from these southern counties, in which climatic conditions are so favourable, that the first impulse towards an improved and more advanced agriculture must come By way of a preliminary enquiry, it behoves us first to ascertain to what extent these favoured tracts of country may be said to have emerged from the primitive age that is characterised by vast areas and small yields.

In Table I. are summarised the average yearly agricultural returns from the three counties in question, from 1896 to 1903 inclusive.

TABLE I

Showing mean yearly agricultural returns from Counties MacDonnell, Robe, and Grey during 1896-1903

	County MacDonnell	County Robe	County Grey	Totals for Three Counties.
Area in occupation (acres), 1901 2	1,088,693	1,166,052	1,136,322	3,391,067
Under cultivation (acres)	2,826	5,761	51,185	59,772
Balance grazed (acres)	1,085,867	1,160,291	1,085,137	3,331,295
Bare fallow (acres)	26	20	1,388	1,434
Garden, 1902 (acres)	37	160	328	525
Orchard 1902 (acres)	26	554	316	896
Vines, 1902 (acres)	12	393	115	520
Wheat (bushels)	17,343	18,412	125,921	161,676
Barley (bushels)	239	859	47,617	48,715
Oats (bushels)	1,077	3,994	94,500	99,571
Peas (bushels)	17	109	1,247	1,373
Potatoes (tons)	15	82	10,864	10,961
Hay (tons)	939	2,416	9,249	12,604
Green forage, cereal (acres)	18	14	738	770
Green forage, lucern (acres)	53	30	492	575
Green forage, sown grasses (acres)	—	30	20,217	20,247
Ensilage (cubic feet)	2,201	436	3,168	5,805
Almonds (cwt)	26	554	316	896
Oranges and lemons (cases)	6	21	17	44
Wattle bark (tons)	55	919	440	1,414
Honey (lbs)	16,010	8,947	11,664	36,621
Wine made (galls.)	—	20,294	116	20,410
Grapes sold (cwt.)	—	2,412	40	2,452
Butter made (lbs)	5,952	84,633	253,453	344,038
Cheese made (lbs)	75	4,972	431,742	436,789

In Table II. I have summarised the mean numbers of live stock of various kinds that have been depastured or fed in the three counties yearly from 1896 to 1903.

TABLE II.

Showing mean yearly numbers of live stock of various kinds in the Counties of MacDonnell, Robe, and Grey during 1896-1903.

	County MacDonnell.	County Robe.	County Grey.	Totals for Three Counties.
Horses (working) ..	609	1,756	5,085	7,450
Horses (other) .	869	2,261	3,044	6,174
Milch cows .. .	351	1,178	6,269	7,798
Other horned cattle ...	1,271	3,791	19,221	24,283
Sheep and lambs	182,564	402,727	632,523	1,217,814
Goats	11	2	75	88
Pigs	212	952	4,617	5,781
Poultry	3,639	10,103	40,306	54,048

Tables I. and II. give a birdseye view of what has been the state of productiveness of these South-Eastern counties during latter years: and is there any one who, on careful consideration, can deny that from three and one-third million acres endowed with a good rainfall the returns are meagre indeed?

To translate statistics of production into monetary returns is no easy matter. Results are too frequently liable to vary with the bias of the calculator. These difficulties notwithstanding, I am led to make the attempt, for in no other way can the importance of the question be brought home to the average mind. The figures that are given in Table III. make no claim to mathematical precision; nevertheless to my mind they set out fairly correctly the position of the South-East; and, in any case, they are open to the corrections of those who can detect errors that may have escaped me.

TABLE III.

Showing mean yearly gross monetary returns from Counties MacDonnell, Robe, and Grey, from 1896-1903.

Cereals	£76,000
Potatoes	60,000
Milk, butter, cheese	75,000
Garden area	7,000
Orchard area	15,000
Vineyard area	3,000
Various crops	10,000
Wattle bark	9,000
Sheep	450,000
Cattle (not milch cows)	75,000
Horses	40,000
Poultry	16,000
Pigs	10,000
	£846,000

We have, therefore, in gross monetary returns, £846,000 from three and one-third million acres, or little over 5s. an acre. If, on the other hand, we admit that one-tenth of the returns from cattle and horses and the totality of those from dairy produce, pigs, and poultry are yielded by the 59,700 acres under cultivation, we find to the credit of the latter area £283,500, or about £4 4s. 10d. per acre; whilst the balance, namely, £562,500, results from purely pastoral operations over 3,331,000 acres, representing approximately 3s. 4½d. per acre.

Such results supply matter for reflection. It is, of course, possible that they may represent gross returns superior to any that could be adduced for any similar area in the State. It is certain, too, that the policy of the early days that aimed at simply replacing the indigenous herbivorous fauna by sheep, and has resulted in the division of the land into individual blocks extending over enormous areas, was the best that could have been devised to ensure for the time being at least the nominal occupation of the country. The land was more or less heavily timbered—and, in fact, remains so still in parts to the present day—population was scanty, labour scarce: the time was not ripe for agriculture properly so understood. In such circumstances, nothing could have occupied the country to better advantage than sheep, that were able to adapt themselves to the native herbage and to benefit by its improvement in quality and quantity under deforestation operations. It is natural, too, that the more fertile tracts of land in the neighbourhood of Mount Gambier should have first come under the influence of the plough: but the question now arises whether the plough is not called upon to make still further inroads into the admittedly poorer country that surrounds the rich agricultural areas, and which at the present time are not returning on the average more than 3s. 4½d. per acre annually.

The hope was expressed only the other day in the daily Press by a gentleman prominently associated with the pastoral industry that the policy that has latterly prevailed of splitting up into agricultural holdings the large pastoral estates would soon come to an end. The large flocks depastured over these vast areas were, he is reported to have added, the backbone of successful sheepfarming, particularly in connection with the export of lambs, in South Australia. The correctness of the latter statement may, perhaps, in present circumstances, be admitted; but to adduce it as an argument against the policy that will eventually increase the actual productiveness of the land twenty and thirty fold, to my mind reveals sufficiently the weakness of the position. Surely nobody can seriously entertain the view that the bulk of

South Australia's most fertile country, within a reasonable rainfall limit, is doomed in perpetuity to a total productiveness of a few shillings an acre? It is not the ruin of the fat lamb industry that is likely to check the inevitable splitting up of large estates, the capital value of which is daily rising, while the power of earning fair interest is undergoing a proportionate fall. Personally, however, I see no reason to despair of the future of the lamb industry were every large sheep station south of Goyder's Line made gradually acquainted with the plough. We are too apt to judge of the future by our present circumstances. It has so often been said that our farming consisted exclusively of wheatgrowing, that it has become almost second nature with us to believe that it cannot possibly be otherwise. Wheatgrowing, after all, is only a stage in our development. First came the pastoral era, then the purely wheat-growing era that we are at present outgrowing; and ahead of us we can already dimly discern that era which characterises the modern agriculture of older countries, in which live stock contribute as much, if not more, to the profits of the farm as the growing crops. It has been said that no proper rotation is possible with us. In present circumstances this cannot, perhaps, be denied, and the reason lies not so much in climatic conditions, as is generally supposed, but in the absence of stock from our farming areas. The secret of successful rotation lies in the fact that subsidiary crops are grown and fed on the land, raising its natural fertility, instead of wasting the latter, as is the case in present practice, and preparing the way for the main crop—the golden cereal. Without stock this is impossible, and so long as sheep are kept merely to clean the fallows and supply the mere "oddments" of the farm, as has been expressively put by one of our contributors, any deviation from the eternal routine of fallow and wheat will, of course, be out of the question; and the argument that farmers must rest dependent on the sheep stations for their ewes must retain all its force. But, unless I am much mistaken, a change in farm practice is imminent, and it is this very fat lamb industry that represents the thin end of the wedge. It cannot be denied that the majority of our farmers are, perhaps, innocent of the arts of the breeder and the ways of stock; in this line the station managers are at present their masters. But with the advent of the fat lamb, fences are being improved, water conserved, and the ways of the beasts studied. Is it supposed that when the large stations disappear the farmer will be incapable of breeding his own ewes? I will admit that the chances of successful selection augment generally with numbers; but it is also possible for these numbers to become too unwieldy for the exercise of individual selection. To whom are due the improvements in our flocks? To the owners of hundreds of thousands or to the owners of a few hundreds that are carefully selected and watched? When, under stress of circumstances, the South Australian farmer joins to his present attributes those of the breeder, his national characteristics will assert themselves, and he will prove no mean follower of those who have created Britain's many magnificent breeds. The division of large estates, instead of reducing our flocks, will augment them. Where one finds at present a scanty living, ten will pasture at ease. This has been the experience elsewhere, and the time is at hand when it will be ours.

I fear that we have diverted considerably from the South-East. I trust, however, that the sequel will show that the diversion is not unconnected with our subject matter; it may possibly, too, have an interest that is its own. It must be evident that if the division of large estates is inevitable throughout the State it is nowhere more certain than in this South-Eastern country, with its never-failing, regular rainfall. From here, too, must come the first real impetus towards the inevitable association of live stock with ordinary farming operations.

(To be continued.)

SWINE FEVER.

By W. C. Quinnell, M.R.C.V.S.

Swine fever may be described as a specific contagious fever, affecting the pig, almost constantly associated with an inflammatory and ulcerative condition of the alimentary tract, less constantly of any other organs, glands, or skin. The disease is caused by a specific micro-organism called the bacillus of swine fever; it is peculiar to swine, and does not affect other animals of the farm. The disease is purely a contagious one, and when an outbreak occurs its origin can always be traced to infection being carried from an area where there has been an antecedent outbreak. Contagion may be conveyed by removal of pigs or their excreta from infected areas to uninfected localities, or any animate or inanimate object freshly contaminated by excreta from swine fever stricken pigs.

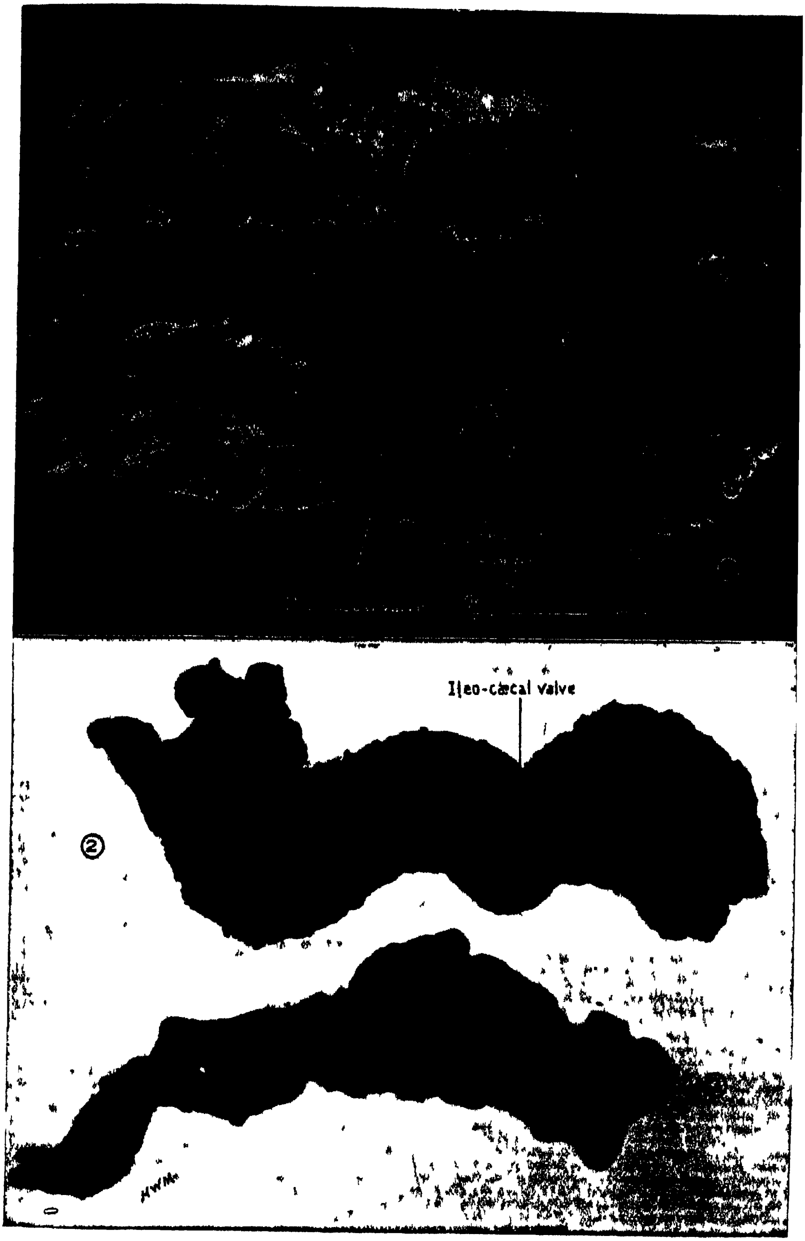
Symptoms are by no means constant, and many of those signs popularly regarded as characteristic of swine fever are frequently observed as symptoms of many other diseases or disorders of pigs. Moreover, in the least virulent form the outward indications of disturbed health may be so slight that an affected pig may readily pass for healthy. When a number of pigs have been exposed to the contagion of swine fever the majority of them begin to show signs of illness in from ten to twenty days. In the more pronounced forms of swine fever the symptoms that are shown by the sick animal will not be very definite until the affection is fairly advanced. Dulness, diminished appetite, hot skin, occasional shivering fits, the back arched, the flanks drawn in - are amongst the first signs of infection. Diarrhœa may occur early in the disease after a short period of constipation, and the evacuations are generally light in colour at first, having a most objectionable odour, becoming darker by-and-by, and in severe cases the discharge consists almost of mucus and blood. Red patches or blotches appear behind the ears, inside the arms, under the belly, and inside the thighs more apparent in light-skinned animals. Discharge of thin fluid from the eyes and nose commonly takes place early in the course of the disease, and as it advances the discharge becomes thick, purulent, sticking about the eyelids and openings of the nostrils. Sometimes there are signs of partial paralysis, and the pig moves in an unsteady manner from side to side, frequently losing the use of one or both hindquarters, and dropping to one side, or dragging both hind legs as it attempts to move forward. Death may take place at various periods from the commencement of visible signs of the affection, sometimes after a few days' illness, while in other cases the animal may linger two or three weeks. Sudden changes in the weather, particularly from warm to cold, appear to increase the fatality of this disease. The mortalities in herds where the ravages of the disease are unchecked average 70 per cent., or even higher. Moreover, the fact must not be lost sight of that animals that have passed through and recovered from a slight attack of the disease are a constant source of infection for several months subsequent to recovery.

Summary of Post-mortem Appearances

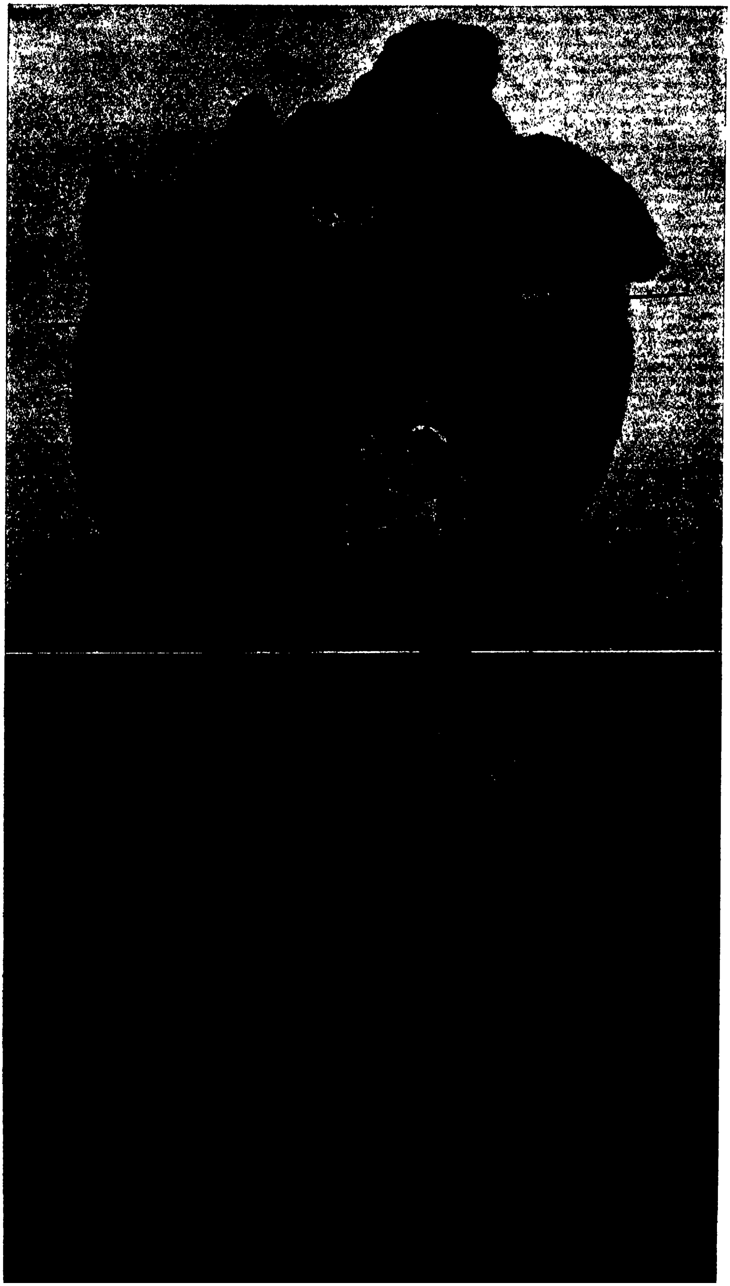
Some of the changes that are effected in the organs of the body by the ravages of swine fever can only be appreciated by the pathologist, others—especially those more characteristic of the chronic condition are patent to the ordinary intelligent observer. The principal lesions are -

(a) Acute Form.—Stomach: The mucous membrane or inner lining is deeply reddened. Small Intestines: The mucous membrane is reddened in patches or uniformly throughout its entire length. Large Intestines The mucous membrane is generally of a uniform dark red appearance right through its length. Blood extravasations (exudations or secretions) are observed in the lungs, heart, kidneys, and lymphatic glands. Spleen: Is enlarged and soft.

(b) Chronic Form.—Characteristic lesions in this form are found chiefly in the large intestines, especially at the base of the valve formed by the entrance of the small intestine into the cæcum (blind gut). These lesions take the form of rounded areas of dead tissue (necrotic), leathery in consistency, raised above the level of the surrounding mucous membrane of the gut, varying in size from [illegible] of a split-pea to a shilling, though by a confluence of a number of these [illegible]s the necrotic areas may become as large as a five-shilling piece. In [illegible] they vary from a yellow to a blackish brown. Necrotic areas may also be found in the liver, spleen, lymphatic glands, or lungs, associated with consolidation of that organ resulting from inflammation.



A —Swine Fever.



MEANS OF ERADICATION.

One of the greatest living authorities on the contagious diseases of animals, Sir George Brown, F.R.C.V.S., late veterinary adviser to the Board of Agriculture, England, has made himself responsible for the statement that "nothing short of cattle plague measures—that is to say, the prompt slaughter of both diseased and apparently healthy pigs on all premises on which the disease has been detected, and the equally prompt imposition of restrictions on the movement of pigs in infected areas—will suffice to eradicate swine fever from England." In this opinion he received the support of Professor McFaydean, M.B., C.M., B.Sc., F.R.S.E., M.R.C.V.S., who states that "it is impossible to deny that this opinion receives the strongest support from the inefficiency of the half-measures which have been employed since 1878, when swine fever was added to the list of contagious diseases within the meaning of the Contagious Diseases (Animals) Act."

The year 1896 marked an important new departure in the system of dealing with the disease in Great Britain. In April of that year the Board of Agriculture issued the Swine Fever Infected Areas Order, which made it illegal to move any pig within the prescribed area unless it appeared to be healthy, and had been on the premises for twenty-eight days, and during that period had not been exposed to the contagion of swine fever. In August of the same year this was followed by the Swine Fever Suspected Zones Order, which imposed less stringent regulations with regard to movement in localities in which it was believed that unreported cases of the disease had frequently occurred. Within a few months after the issue of these orders the weekly returns of outbreaks began to show declining numbers, and decline continued until, as indicated by the published reports, the disease became only half as prevalent as it had been in 1894 and 1895.

When put into force the working of these Acts produced such excellent results in diminishing the number of outbreaks that it was predicted by competent authorities that the eradication of the disease was a question of the near future, but, unfortunately, by a premature relaxation of these restrictions the disease showed a recrudescence in 1898.

REFERENCE TO PLATES.

A.—*Swine Fever.*

1. Cæcum (blind gut) from a pig dead of swine fever, laid open to show the characteristic ulcers of the mucous membrane. The lesions take the form of rounded areas of dead tissue (necrotic), leathery in consistency, raised above the level of the surrounding mucous membrane of the gut.

2. Cæcum or blind gut of pig. In rare cases the necrosis—instead of appearing in circumscribed ulcers as in No. 1—involves the whole surface of mucous membrane, giving it the appearance of a so-called diphtheritic membrane.

3. Cæcum, showing normal mucous membrane.

B.—*Swine Plague.*

1. Pig's lungs. The line indicates the portion involved in disease—hepatized regions (liver-like).

2. Section of diseased lung—lung structure hepatized due to broncho-pneumonia.

3. A peculiar croupous exudation on the mucous membrane, considered by Dr. Salmon (Chief of the Bureau of Animal Industry, Washington) as the effect of swine plague bacteria in the large intestine.

[The above article, by our recent visitor, Mr. Quinnell, Veterinary Surgeon to the Queensland Department of Agriculture, is republished from *The Queensland Agricultural Journal*, in response to requests from various Branches for a description of the symptoms of swine fever. We are indebted to the Queensland Department also for the loan of the blocks illustrating the article.—Ed.]

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DEPARTMENTAL NOTES AND WORK.

Professor Perkins visited Clare and Auburn districts during November, and inspected various orchard and vineyard properties. Everywhere vines and fruit trees were making magnificent growth, and the setting of fruit generally was apparently satisfactory. The currant crop promises to be heavy. Feed was plentiful, and stock as a whole in good condition, though in some parts the lambs had not been thriving owing to the unusually cold weather experienced. The wheat crops had grown well, but rust was prevalent throughout the district, and as a consequence a large area was being cut for hay.

On Wednesday, November 11, the members of the Council of Agriculture visited Roseworthy College for the purpose of inspecting the crops on the College Farm. On the following day three of the members visited Messrs. Marshall Brothers' farms and inspected their experimental plots, where a large number of new wheats were seen.

On November 6 the Principal of the Agricultural College visited Gladstone and gave a public lecture under the auspices of the local Branch of the Bureau.

There are now fifty-one students in residence at the College. Harvesting operations are being pushed on vigorously. During the month a trained gardener has been appointed to look after the vegetable garden and to attend to the lawns and flower beds about the College buildings

Mr. G. S. Thomson, Dairy Instructor, has visited Penola, where he delivered an address on the dairy breeds of cattle to a good gathering of farmers. At Mount Gambier he gave instruction in cheesemaking at two factories and attended to other departmental work in the district. Dairy cattle were noticed to be in first-class condition in all parts of the South-East, and at the largest dairy farms near Mount Gambier Mr. Thomson inspected herds of remarkably heavy milkers, all of which belonged to the Shorthorn grade. Very fine bullocks of the Shorthorn-Jersey cross were also seen, and big prices are expected for them at the fat stock sales.

Weekly shipments of butter continue to arrive at the Government Depot from most of our factories. Grading reports have been well attended to by the factory managers, and in most instances improvement in the quality of butter has followed the instructions given. Mr. Thomson informs the Department that he has awarded for the first time maximum points (100), for a consignment of unsalted butter, shipped by the Messrs. Tuckwell & Son, of Wilmington, for the London market. The same firm has secured 99 points for salted butter, now at the Government Depot, prior to its dispatch by the steamer Himalaya on December 3. Samples of milk, butter, and cheese have been received for testing purposes, and where taints have been detected remedies were found.

Besides conducting the usual lectures and demonstrations in fruit culture at the Agricultural College, Roseworthy, Mr. Quinn has visited several orchards at Gawler River, and given practical instruction in summer pruning. He has also assisted Professor Perkins in the investigations he is making into the subject of ringing the currant and other grape vines. Mr. Quinn has also engaged a competent gardener (Mr. A. Williams) to carry on the work in the vegetable and ornamental gardens at the Agricultural College. This will not only assure results of a more definite nature, but the advantage of having a capable man to guide [illegible] labour should be of considerable value to the students.

The reticulation of the College orchards being completed, the Barossa water was turned on to the trees in the northern orchard by Mr. Quinn on November 25, and the facilities for applying the water proved adequate.

During the month ending November 26 Inspectors Brown and Rowell have inspected and admitted to the State 7,260 bushels of fruit, 52 bushels of vegetables, and 89 packages of plants. In the course of this work 256 bushels of bananas and four packages of plants were destroyed and detained respectively owing to their condition on arrival not conforming to all the requirements of the law dealing with the introduction of fruits and plants. The imported fruits consisted of tropical produce, such as bananas and pineapples, with the exception of 30 cases of Tasmanian apples. Fifteen cases of apples and passion fruit were imported by rail. During the same period these Inspectors certified for export to interstate markets 6,426 cases of fruits, 4,238 packages of vegetables, and 34 parcels of plants. These were made up of twelve different kinds of locally grown fruits, of which oranges, lemons, loquats, and cherries were sent away in quantities agreeing with their respective positions in the above list.

COUNCIL OF AGRICULTURE.

The monthly meeting of the Council of Agriculture was held on Wednesday, November 11, at Roseworthy College, there being present Messrs. R. Caldwell (chair), R. Marshall, A. Molineux, G. R. Laffer, and T. E. Yelland.

The morning was spent in visiting various parts of the farm and examining the crops. Rust was more or less noticeable in most parts, but difference of opinion existed as to whether the yield would be affected to any extent. In the experimental plots some of the later maturing wheats were affected in the ear, and will, no doubt, suffer considerably. Professor Towar pointed out that were he farming merely for profit he would cut these wheats for hay, but as they were portions of the variety tests they would have to take their chance. Mr. Marshall suggested that too great a proportion of rust-liable wheats were being grown at the College, but Professor Towar said that, viewing the results from the experimental plots, he was inclined to doubt whether they would get a greater profit from other sorts than from King's Early and College Selection.

It was resolved to recommend that several acres of both sandy soil and limestone scrub lands be devoted to experiments with different kinds of saltbush, to test their value for fodder purposes in the Lower North.

A list of books on agriculture suitable for Bureau libraries and country Institutes was submitted by Professor Towar. It was decided to ask the other officers of the Department of Agriculture to suggest other suitable books before publishing the list.

The following gentlemen were appointed members of the undermentioned Branches:—Utera Plains, Messrs. W. Jacobs and R. Harnhardt; Clare, Mr. George Main; Woodside, Mr. H. James.

It was decided to recommend to the Hon. Minister that a greater portion of the time of the Dairy Instructor be allotted to the College, in order to give the students more opportunity for practical dairy work.

MONTHLY RAINFALL.

The following table shows the rainfall for the month of November, 1903:—

Adelaide	2 56	Manoora	4·15	Echunga	2·91
Hawker	1·86	Hoyleton	4 45	Macclesfield	2·91
Cradock	1·89	Balaklava	4·42	Meadows	3·50
Wilson	1·66	Port Wakefield	3·16	Strathalbyn	2·57
Gordon	3·15	Saddleworth	4·22	Callington	3·49
Quorn	5·36	Marrabel	4·43	Langhorne's Bridge	2·56
Port Augusta	2·43	Riverton	5·30	Milang	2·81
Port Germein	4·39	Tarlee	3·73	Wallaroo	1·77
Port Pirie	3·07	Stockport	3·81	Kadina	2·85
Crystal Brook	2·67	Hamley Bridge	3·50	Moonta	2·08
Port Broughton	2·55	Kapunda	3 05	Green's Plains	2·92
Bute	2·86	Freeling	3·57	Maitland	3·30
Hammond	4·71	Stockwell	2 79	Ardrossan	2 74
Bruce	5·14	Nuriootpa	3·28	Port Victoria	1:53
Wilmington	5·54	Angaston	3·03	Curramulka	2·15
Melrose	3·52	Tanunda	2 72	Minlaton	1·73
Booleroo Centre	4·40	Lyndoch	3·17	Stansbury	1·85
Wirrabara	3·34	Mallala	2·63	Warooka	1·76
Appila	3·52	Roseworthy	3·02	Yorketown	1·27
Laura	3·01	Gawler	2·93	Edithburg	1·37
Caltowie	3 23	Smithfield	2·63	Fowler's Bay	0·32
Jamestown	3·71	Two Wells	3 26	Streaky Bay	1 06
Gladstone	3·71	Virginia	2·79	Port Elliston	0 64
Georgetown	4·33	Salisbury	2·93	Port Lincoln	0 78
Narridy	4·12	Tea Tree Gully	2·64	Cowell	1·35
Redhill	2·97	Magill	2·64	Queenscliffe	0·98
Koolunga	3·49	Mitcham	2·72	Port Elliot	2·15
Carrieton	2·61	Crafers	3·36	Goolwa	2·49
Eurelia	2·69	Clarendon	3·13	Meningie	2·06
Johnsburg	3·95	Morphett Vale	2·26	Kingston	1·59
Orroroo	2·46	Noarlunga	2·00	Robe	0·92
Black Rock	4·60	Willunga	2·28	Beachport	1·12
Petersburg	3·42	Aldinga	1·87	Coonalpyn	1 75
Yongala	3·36	Normanville	1·36	Bordertown	1·36
Terowie	3·93	Yankalilla	1·80	Frances	1·90
Yarcowie	4·05	Eudunda	4·88	Naracoorte	1·15
Hallett	3·60	Truro	2·26	Lucindale	1·15
Mt. Bryan	2·95	Palmer	2·53	Penola	1·20
Burra	3·09	Mount Pleasant	2·93	Millicent	2·70
Snowtown	3·84	Blumberg	3·31	Mount Gambier	2·23
Brinkworth	3·52	Gumeracha	2·99	Wellington	3·15
Blyth	4·09	Lobethal	2·52	Murray Bridge	2·47
Clare	5·05	Woodside	2·72	Mannum	2·60
Mintaro Central	4·21	Hahndorf	3·44	Morgan	3·21
Watervale	4·35	Nairne	3 42	Overland Corner	5·78
Auburn	4·20	Mount Barker	3·45	Renmark	3·41

FARM AND DAIRY PRODUCE MARKETS REVIEW.

Messrs. A. W. Sandford & Co. report December 1, 1903:—

Nearly all the conditions favoured an excellent harvest right into the middle of November, the crops throughout invariably ripening splendidly; therefore it was fair to assume that the predictions of heavy wheat yields would be fully realized; but during the last week or ten days sultry weather set in, terminating in thunderstorms, accompanied by unusually heavy rain, which, it is feared, has injured the crops in some of the districts, for at time of writing reports just coming to hand at to that the rains were such that harvesting operations had to be abandoned for the time, and even heaps of grain that had been stacked in the fields were partly submerged; but the extent of damage done is not yet ascertainable. On the other hand, reservoirs, tanks, and dams had not been so well filled for many years, and pastoralists strongly assert that from their point of view the rains will be of great benefit.

In Commercial Circles tradespeople complain of unusual dulness, which is unaccountable in face of the fine harvest prospects, and also at the time of year when buyers begin to prepare for Christmas requirements. At all events, people are acting cautiously, although there are no insolvencies of any magnitude to report, financiers seeming satisfied that the atmosphere in this direction is clear. In Minerals, Copper has suffered a decline since our last, with offers to sell for forward delivery at even further reductions. Silver has continued at about the same figure, with one or two slight fluctuations. In Lead values have been almost stationary, although during the past few days a slight hardening has taken place.

In Breadstuffs, the European markets are reported as full, and declining in consequence of anxiety on the part of United States to sell. Some say this is caused by the Money Market, others by the large crop about to be reaped in the Argentine, the area under wheat there having increased 30 per cent. on last year, and is now estimated at 8,887,500 acres; the latest information reports favourable weather and very encouraging prospects. For cargoes for U.K., 30s. per quarter (480), c.i.f. and e.. is the highest price obtainable, but there are no anxious buyers at that figure. Wheat began to arrive at Port Adelaide from the outports during the early days of November, and the first shipment of new flour was made by the Perth, which sailed on the 5th. Both New South Wales and Victoria have been purchasers of new wheat and flour, and during the first half of the month values ruled high, wheat 3s. 9d. per bushel, and flour £10 per ton. Prices, however, rapidly declined, and the eastern States have withdrawn from the market in consequence of deliveries of local grown wheat. Millers' Offal. Bran and Pollard have been neglected. Forage. The crops cut for Hay are the heaviest for many years, and in the absence of export trade this line is almost stagnant, so that values have come down with such a run that farmers are not disposed to accept the present prices offering. Chaff. No shipping trade has been put through, business being restricted entirely to local orders. The same cause is affecting the Grain Market, Oats being offered at what is considered the lowest price on record.

Potatoes.– Quite unexpectedly for the month of November the sales effected of old season's (Gambiers) have been the largest experienced for many years, so that stocks of old are now pretty well exhausted in fact, only a few of inferior quality are left. The new local grown have been coming forward fairly freely, and as the quantity and quality are reckoned above usual standard have sold readily at good rates, although during the past week had to give way a little owing to importations from Victoria. Onions.—It looks as though holders of old season's will be stranded with stocks, which are rapidly deteriorating, and not likely to sell, as now the new crop is coming on the market.

During the first couple of weeks of November ideal weather prevailed for the marketing of Dairy Products in the best of order. In Fresh Butter supplies showed no sign of diminution, and as prices for prints had touched bedrock, buyers purchased heavily for then and future requirements; but during the latter part of the month an abrupt shrinkage was noticeable, which was partly attributed to farmers busy harvesting, to the neglect of the dairy, and also to the sultry, unfavourable weather. Regular shipments of Bulk have been made to the Home Market, whilst at the same time we have been supplying Broken Hill with her wants, and a fair trade has been done with Western Australia. Eggs. There is very little alteration to report, except some slight fluctuations in values, and at time of writing show three farthings advance on former quotations. Supplies have kept up wonderfully well, and with heavy eastern orders coming along the market has been kept well cleared. Cheese. Good seasonable business has been put through, the weather enabling the new make to travel with fair success, so that rates have maintained. Bacon.—With the near approach of Christmas it was reckoned that values would, at any rate, hold: but, with several curers anxious to unload their stocks, prices have had to ease nearly a penny. Hams, as expected, are having better attention, buyers readily purchasing all convenient weights offering. Honey is moving more freely again, but no improvement in price to record. Almonds have also had better sale, several parcels having been placed for export.

Live Poultry.– Tall rates have ruled throughout the month, more especially during the earlier half, supplies then being far short of buying orders, resulting in keen competition; but the last two or three markets have brought along much fuller quantities, and although extreme rates were not touched, still satisfactory prices were secured.

MARKET QUOTATIONS OF THE DAY.

WHEAT.—At Port Adelaide, shipping parcels, new, 3/2 per bushel 60 lb.

FLOUR.—City brands, £8 12/6; country, £8.

BRAN.—6½d. to 7d., **POLLARD**, 8½d. to 9d. per bushel 20 lb.

OATS.—Local Algerian and Dun, 1/2 to 1/3, White Champions, 1/7 to 1/9 per bushel 40 lb.

BARLEY.—Malting, nominal, 3/3 to 3/8; Cape, nominal, 1/6 to 2/ per bushel 50 lb.

CHAFF.—£2 7/6 to £2 10/- per ton of 2,240 lb., bags in, f.o.b. Port Adelaide.

POTATOES.—Gambiers, £2 15, new locals, £6 to £7 per 2,240 lb.

ONIONS.—Gambiers, £2 to £2 15/; new locals, £4 per 2,240 lb

BUTTER.—Creamery and factory prints, 8½d to 9½d, private separator and best dairy, 7½d. to 8½d.; well-graded store, 6d to 6½d.

CHEESE.—S.A. best factory, 7½d. to 8d., fair quality new make, 6d. to 6½d. per lb.

BACON.—Factory cured sides, 8d. to 8½d, farm flitches, 6½d. to 7d. per lb.

HAMS.—S.A. factory, 9d. to 10d. per lb

EGGS—Loose, 8½d., in casks, f.o b, 10½d per dozen.

LARD.—In bladders, 6d to 6½d tins, 5d to 6d per lb.

HONEY.—2½d for best extracted, in 60-lb tins, **BEESWAX**, 1/1 lb.

ALMONDS.—Fine softshell, 5d, kernels, 10d to 10½d. per lb.

LIVE POULTRY—Heavy-weight table roosters realized 2/3 to 2/10 each; good-conditioned hens and plump cockerels 1/4 to 1/10 poor and light, 1/2 to 1/4, ducks, 2/ to 3/, geese, 2/9 to 3/9, pigeons, 6½d turkeys, from 9d. to 11d per lb. live weight, for fair to good table birds

Above quotations, unless when otherwise specified, are duty paid values on imported lines. Grain, Flour, and Forage for export are f.o.b. prices at Port Adelaide Dairy products are City Auction Mart rates. In Grain, Chaff, and Potatoes sacks are included but weighed as produce Packages free with bulk Butter and Cheese.

THE JOURNAL OF AGRICULTURE.

The officers of the Department of Agriculture have for a long time recognised that The Journal of Agriculture did not reach nearly as many of our producers as it should. Believing that it would not only benefit the individual, but the State generally, if we could place our monthly journal in the hands of every producer, suggestions were some time since made to the Hon. Minister of Agriculture with a view to extending our sphere of usefulness. It was proposed to make an annual charge of 1/; this is merely a registration fee, and is mainly intended to prevent those who would take no real interest in it applying for The Journal, as they might do if it were quite free of any charge. This proposal was submitted to the branches, and with but one exception all those who considered the matter heartily support it.

We are pleased to be able to announce, therefore, that the Minister of Agriculture has approved of our proposal, and that from the January issue of The Journal any one interested will, on the payment of the sum of 1/ per annum, receive The Journal each month as issued. Will the members of the Agricultural Bureau please bring this matter under the notice of their friends, and send on names and addresses of as many subscribers as they can secure, together with the year's subscription.

AGRICULTURAL BUREAU REPORTS.

Lucindale, October 31.

Present—Messrs. E. Feuerheerdt (chair), Carmichael, Tavender, Matheson, and Dutton (Hon. Sec.).

Tick.—Members had noticed sheep tick to be prevalent this year, and thought it would be well for sheepowners to take extra precautions in regard to dipping. Feed is exceptionally abundant. Sorrel is proving a very troublesome weed in some parts.

Dairying.—The Hon Secretary reported death of Holstein bull Friesland, which belonged to the Branch. General regret was expressed by members at the loss of the bull, as he had left some exceptionally good stock. Mr. Tavender had noticed that the Department had stated that the system of loaning bulls to Branches had not proved altogether a success. As far as this Branch was concerned the remarks did not apply, as they had, as a result of the action of the Department, secured stock that it would have been impossible for them to have otherwise obtained. A neighbour had a two-year-old heifer by Friesland that was giving 1 lb. of butter daily. Mr. Carmichael stated that the stock by the bull were the best-looking in the district, and were worth 30/ per head more than ordinary cattle. It was decided to make an effort to purchase another bull.

Horsebreeding.—Mr. Dutton read a paper on this subject. He thought when, as was recently the case, they heard of one station owner selling over 1,000 horses at a sale, and that after a season of unprecedented drought, it was evident that it was idle to contemplate raising good horses in the South-East. Their own experience in horsebreeding was not satisactory. In 1880 they had 20 breeding mares at Ardune, six or eight of which were good draughts. The latter, however, were not young, and had been accustomed to better country than that at Ardune. Special paddocks were kept for the mares, and a considerable area of land was cultivated to comply with the laws under which they held their land, so that they were well kept. A fairly good draught stallion was kept to mate with the mares. Within five years all the best mares died either in foaling or by accident. In 1885 20 horses, unbroken, were sold at £15 each, as the market for draughts was falling. As there appeared an unlimited demand for horses for India, and some light horses they had fetched better prices than the draughts, they put a blood stallion with the medium draught mares. The produce were good, useful horses, but financially the venture was a failure, as their stallion was a low, thick-set animal, and left very good, chunky horses, but then Indian buyers would not look at them, insisting on horses of a certain height. Yet these horses were the very class so much sought after for military purposes two or three years ago for South Africa, and would have paid them well. In 1890 they kept some of the lighter mares that were practically unsaleable, and turned them out with a draught colt, letting them take their chance. The progeny proved good, serviceable horses, suitable for spring-dray, plough, or other work of this character. If somewhat undersized they are stout and strong, and sell readily at satisfactory prices. He did not think it would pay them to produce good, large horses, as they must be kept well fed from their birth, whereas if a stout, chunky animal goes on short rations for a time when young he will still do for the buggy if not big enough for a spring-dray. They will fetch from £7 to £10, and at this pay better than cattle.

Swan Reach, October 30.

Present—Messrs. Baker (chair), Arnold, Zadow, Rowe, Fidge, Hecker, Harris (Hon. Sec.), and five visitors.

Manure Tests.—Meeting was held at the residence of Mr. R. J. Harris for the purpose of inspecting his experimental plots. The plots were five acres in extent and 40 chains long, running north and south, to include in each plot an equal proportion of grey, stony soil and deep sand. On the stony soil there was very little benefit to be seen from the use of the manure, but on the sandy soil there was a marked difference between the manured and unmanured plots. Members were of opinion that with the aid of mineral super much of the country east of the Murray could be turned to profitable account.

Longwood (Mylor), October 31.

Present—Messrs. W. Nicholls (chair), J. Nicholls, Mundy, T. J. and E. J. Oinn, Bradley, Hemer, Vogel, Hughes (Hon. Sec.), and nine visitors.

Wheat and Oats for Hay.—A member asked what wheat could be sown with Algerian oats for hay, so that both would be fit to cut at the same time.

Selling Produce by Weight.—Members generally agree with Mr. Bray, Gawler River Branch, that all produce should be sold by weight.

Codlin Moth.—Mr. E. J. Oinn showed samples of Gravenstein apples the size of ordinary marbles. In his paper read at Cherry Gardens he stated that he sprayed for codlin moth about the third week in October, when the fruit was as big as marbles. Some of the delegates thought he had made a mistake in the date, but the specimens tabled showed that the early fruits should be sprayed before the end of October. Mr. Oinn stated also that he had kept some codlin moth caterpillars in a box, and the first moths hatched out during the third week in October. A member wished to know how much time would elapse before eggs were laid and the young caterpillars hatched out.—[Judging from American experience, about a week would elapse before the caterpillars began to hatch out.—Ed.]

Morchard, October 31.

Present—Messrs. Longbotham (chair), Barrie, Kirkland, Kupke, Kitto, McDougall, O'Loughlin, Graham, Forbes, Reichstein, Toop, and Beck (Hon. Sec.).

Ice Plant.—Members consider this plant should be placed under the Noxious Weeds Act, as it is a very undesirable weed. Members regret that the Act cannot be more satisfactorily carried out. At present any Council attempting to put the Act in force experiences considerable trouble in getting anything done.

Irrigation.—Mr. O'Loughlin read a paper on this subject. The lack of capital to conserve the floodwaters which go to waste year after year was one of the greatest drawbacks to the prosperity of the district. He thought nearly every farmer could, however, conserve sufficient water to irrigate a small area of land during the summer. He also thought a small area of land carrying a crop for hay could be irrigated during the winter, and a larger crop secured than would be cut from a much greater area of unirrigated land. Members consider that much good could be accomplished by farmers in a small way, and also that some of the creeks could be easily utilized for the conservation of water. Many residents are strongly of opinion that the much-talked-of Pekina Creek scheme could be made a success at a minimum of cost. It was resolved to have the water from a number of wells tested to ascertain whether it was suitable for irrigation purposes.

Paskeville, October 3.

Present—Messrs. Pontifex (chair), H. F. and H. Koch, Wehr, T. H., S. R., and J. C. Price, Goodall, Westphall, and O'Grady (Hon. Sec.).

Co-operation in Purchase of Manure.—Members of this branch have agreed to purchase all the manure required by them for next season in one line. The hon. secretary reported having ordered the manure wanted, and that he had been able to make much better terms for a large quantity than the individual members could have secured.

Field Trial.—A committee was appointed to make all necessary arrangements for the forthcoming field trial of harvesting machinery under the auspices of the Northern Yorke's Peninsula Bureau Field Trial Society.

Castrating Colts.—Discussion took place as to whether it was better to castrate colts very young or to leave them until one or two years old. One of the best workers that Mr. T. H. Price has was castrated when only a foal, and other members thought there was less risk and less pain if the operation was performed early, though the animal might not present so masculine an appearance as if castrated later. Mr. Goodall preferred to leave the colt until it was a year old.

Port Pirie, October 31.

Present—Messrs. Johns (chair), Hannan, Wright, Crispin, Morrish, Jose, Wilson (Hon. Sec.), and four visitors.

Northern Conference.—Members favor holding Conference at Crystal Brook in preference to Gladstone.

Ice Plant.—Some discussion took place on the question of this plant being declared a noxious weed. Mr. Crispin scarified and harrowed a patch of the weed six weeks ago, but the plants were still alive and flowering. Owing to the uneven nature of the soil rolling was not effective. Mr. Welch had scarified a bad patch, but had only thinned it somewhat. All those present admitted that this was one of the worst enemies the landholders had to contend with, but no practicable remedy could be suggested. For this reason members did not care to recommend that it be declared a noxious weed.

Horses' Teeth.—Mr. Higgins gave an instructive address on this subject.

Booleroo Centre, November 3.

Present—Messrs. Clack (chair), Nottle, Murdoch, Repper, Kelly, Steven, Sargent, McMartin (Hon. Sec.), and three visitors.

Disc Ploughs.—Mr. Nottle referred to use of these ploughs on the Roseworthy College Farm. He would like to know how the cost for wear and tear, horseflesh, &c., of these ploughs compared with the ordinary stumpjump ploughs turning over the same amount of soil.

Dairying.—Mr. Murdoch read a paper on the use of the separator and the breeding of dairy cattle. He described a visit paid to a farm dairy where 15 cows were milked daily, and the milk put through a hand separator, treating 45 gallons per hour. All the work was done by the farmer, his family of four (the eldest being only 14 years of age), and the help of a hired boy. The cows are treated kindly, and as a result even the children can milk almost any cow in the open without trouble. The skim milk is used for feeding calves and pigs. The calves thrived splendidly on the milk, as did the pigs, with other food in addition. Any surplus milk was allowed to stand until it thickened. It was then put on the fire and cooked, and then given to the fowls. The fowls were very fond of this, and from his own experience he could recommend it to increase the production of eggs. He was very strongly impressed with the value of the hand separator for small farms, and was of opinion that under the pan system they were not making all the profit they should out of their cows. Most of the cows he saw in the Baroota district were crosses from the Shorthorn, and he found them very useful animals. Some young stock, the progeny of a crossbred Holstein-Ayrshire bull, were very promising. For farmers he thought the Holstein-Jersey cross would be most profitable. Mr. Murdoch also gave an account of a visit to the Port Germein Butter Factory. The Chairman stated that he had lost for a week a cow in full milk, and although when found her udder seemed full of milk the milk was bad, and she quickly went almost dry. He was advised by a friend to milk her three times a day. He had done that, with the result that in two days she came back to full milking.

Arden Vale, November 2.

Present—Messrs. Warren (chair), Eckert, Fricker, Schuttloffel, Starr, Klingberg, and Hannemann (Hon. Sec.).

Annual Meeting.—This being the annual social gathering in connection with the Branch, a large number of people were present. Songs, recitations, and music assisted to make a very enjoyable meeting. Reports of proceedings of annual Congress were given by the delegates. Some discussion took place on the financial aspects of farming, and the Chairman expressed the opinion that it was more profitable to live on the farmer than on the farm. He strongly urged those present to support the Farmers' Co-operative Union, in order to do away with the middleman's expenses. The initiation of auction sales of grain was also commented upon. Mr. Seale initiated a discussion on the handling of wheat, and considered that the adoption of the elevator system would result in a considerable saving to the farmer.

Tatiara, October 31.

Present—Messrs Fisher (chair), Stanton Hall Penny, Killmeir, and Bond (Hon Sec)

Annual Report —The Secretary's report showed nine meetings held, with an average attendance of 7 5 members Only one paper was read during the year Messrs W E Fisher and J K Bond were re-elected Chairman and Hon Secretary respectively and Mr E Prescott one of the original members of the Branch, was appointed an honorary life member in recognition of his services

Woodside, November 2.

Present—Messrs Caldwell (chair), Hutchens, Drogemuller, Keddie, Pfeiffer, Kleinschmidt Rollbusch Johnston and Hughes (Hon Sec)

Improvement of Wheats —The Chairman reported at length on a visit to Messrs Marshall Brothers' farms near Wasleys and described the various new wheats being tested there While some of the crops in the district were nearly rotten with rust Messrs Marshall had several varieties quite free

Wepowie, November 4.

Present—Messrs Gray (chair) Chrystal T and R Gale Orrock, and Halliday (Hon Sec)

Ice Plant —There is very little of this plant in the district but in view of the trouble it has given in other localities members think it should be placed on the list of noxious weeds and steps taken to get rid of it before it gets too strong a hold of the land

Hay – Mr Orrock read a paper on this subject He strongly believed in green hay in preference to allowing the crop to stand until there was some grain in it He found Early Para and Bartlett's Crossbred good wheats to grow in this district for hay They were both early varieties and came to maturity with the oats Neither of them was so liable as Steinwedel and Smart's Pioneer to break when handled When feeding long hay—and for young horses he much preferred it to chaff except at midday feeding—loose hay was much better than sheaved hay Where the latter is used the string should be cut and the hay mixed as well as possible so that the horses cannot simply pick off the heads It was not a good plan to cut any very rank growth for hay In cutting selfsown or dirty oat crops for hay allow it to lie on the ground for some time before raking as the bitter taste of the green oats will to a large extent disappear They should be careful to give their stock only hay or chaff of good quality and it should be as free as possible from weeds

Wilmington, November 4.

Present—Messrs Slee (chair) Schuppan Bischof Robertson, McLeod Broadbent, Payne (Hon Sec) and two honorary members

Ice Plant—It was resolved that the Department be urged to have the necessary steps taken to declare this plant a noxious weed At present the plant is scarcely known here, but steps will be taken to at once destroy any that can be found Attention was also called to the rapid spread of a useless weed with a blue flower It grew strongly in the watercourses, and nothing seemed to touch it —[This is *Echium vulgare*, a useless weed that covers considerable areas of good land in various parts of the Lower North and near Adelaide It is not known to be injurious to stock, but as it occupies good land to the exclusion of useful herbage, a strong effort should be made to destroy it —Ed]

Horsebreeding —Paper read at previous meeting by Mr Robertson was discussed Most of the members supported the writer's contentions, but Mr. Bischof did not altogether agree with the advocacy of the crossbred

Kingscote, November 9.

PRESENT—Messrs. Turner (chair), Melville, Wright, Carter, Ayliffe, Whittle, Lapman, Bell, Nash, and Cook (Hon. Sec.), and four visitors.

MANURES.—Mr. J. Turner read a paper on "Commercial Fertilisers." He had had it brought forcibly under his notice that they could not crop land for long without impoverishing it unless it was manured. Some years ago his crops were very poor, and he decided to try manures. He ploughed up a forty-acre paddock, and applied bonedust and bone super at the rate of 2 cwt. per acre to all but a strip of four acres. This was before the advent of the drill, both manure and seed being broadcasted. From the manured land he got 25 buhels per acre, and only 5 bushels from the other. Ever since then he had used manure freely, various kinds being tried. He found guano super, while causing good growth at the start, did not appear to last, and the yield was not benefited materially. He got no result at all from guano, and Thomas phosphate was almost as bad. Nitrate of soda mixed with bone super gave fair results, but not so good as sulphate of ammonia and super mixed at rate of one of the former to four of the latter. He had got up to 80 bushels of barley per acre where this was applied. He had a crop this year manured with sulphate of ammonia and bonedust which promised to yield nearly 80 bushels per acre. He did not think any commercial manure equal to stable manure, but they could not get enough of this. He would, however, advise them to fallow some of the land and apply all the stable manure available to it. 10 to 20 acres treated in this way would be more remunerative than 50 to 60 acres roughed in. They could not say definitely which manure was best, as it would all depend upon soil and local conditions, but he would not advise them to keep on applying the same kind of manure. Mr. Chapman found Thomas phosphate a failure; he liked to plough in green manure. Most of the members were agreed that on Kangaroo Island they could profitably apply up to 2 cwt. or more of super per acre. Mr. Wright stated that he had cut potato setts and dried them with potato manure, with the result that they failed to grow. Another member dried pickled barley with super, and the seed failed to germinate. Mr. Melville used potato manure for potatoes, melons, and marrows, with very satisfactory results.

Cherry Gardens, November 10.

PRESENT—Messrs. Burpee (chair), Lewis, Jacobs, Wright, and Hicks.

CATERPILLARS.—Members reported that moths of various kinds had been extremely numerous, with the result that caterpillars were only too prevalent. Much damage has been done to the potato crops, and other green vegetation has suffered. The small ground wasp was noticed busily engaged in feeding on the caterpillars. Some disease, causing death of domesticated cats, was reported as prevalent in the locality.

Clare, October 30.

PRESENT—Messrs. Kelly (chair), Christison, Lloyd, Martin, McCarthy, Dolan, and Greenway (Hon. Sec.), and one visitor.

RAPE.—Mr. Lloyd thought that rape for early feed would prove profitable in this district, as there was often a shortage of feed in winter and early spring. Mr. A. J. Davey (visitor) stated that he sowed 5 lb. of rape seed per acre on 15 acres last February. The crop came away well, and grew quickly to height of about 18 in. except where sown too thickly. He thought 3 lb. per acre quite enough to sow. In June the cows were turned on to the field, and partook freely of the rape. The flow of milk soon increased, but the food gave it a disagreeable flavour. He thought it better to broadcast the seed. Fifteen acres sown to rape was equal to 75 acres of stubble for feeding purposes. With cattle the rape was not prevented from seeding, consequently there was some difficulty in keeping the land clean.

RINGING CURRANT VINES.—Mr. Hague mentioned that he was reported in the November issue of *The Journal* to have stated that where he simply made a single or double cut around the vines, without removing the bark, the yield was doubled. This was an error, as the increase was to the extent of 50 per cent., compared with untreated vines.

Davenport, October 29.

Present—Messrs. Lecky (chair), Roberts, Hewitson, McDowell, Holdsworth, and Pybus (Hon. Sec.).

Ice Plant.—Most members favour this plant being declared a noxious weed, though it is found useful for holding the sand in this district.

Land for the People.—Mr. Lecky read a paper deploring the trend of population to the cities, and advocating the resumption of large estates on reasonable terms in order to make them available for settlement. A lengthy discussion ensued.

Denial Bay, October 31.

Present—Messrs. Smith (chair), McKenzie, Starling, Croker, Hoffrichter, Weisselman, Moier, Lowe, and Gale (Hon. Sec.).

Oats and Barley.—Members generally thought it advisable to grow a limited acreage of oats and barley each year. Mr. McKenzie pointed out the necessity for exercising great care in growing barley, or the seeds would be carried into the paddocks by stock and make the wheat lands dirty.

Green Manures and Root Crops.—Discussion took place on growing crops to plough under, also peas and roots for fodder, but it was agreed that the district was too dry for these practices.

Manures v. New Land.—Mr. Lowe asked whether it would be better to use the drill and manure the crops on the older cultivated land or to clear new scrub land for cropping. The Hon. Secretary strongly advised manuring and cropping the old land, but at the same time he would clear as much scrub land as possible each year.

Rust-resistant Wheats.—Discussion on this subject took place. The Chairman offered a challenge that he would produce from 10 acres of land as much grain during a period of ten years with rust-liable wheats as any member would on the same area of equal quality land sowing only rust-resisting varieties. He also stated that he considered that this year the loss from rust and frost in this district was equivalent to 25,000 bags of wheat. Members' reports bore out this estimate.

Salt Patches.—Mr. Starling stated that he had applied lime to a patch of salty soil and saw considerable benefit the first season. Next year he gave another dressing with lime, and now the salt seemed to have disappeared.

Port Broughton, October 29.

Present—Messrs. Harford (chair), Pattingale, Dennis, Barclay, Dolling, Whittaker, and Dalby (Hon. Sec.).

Business.—The Chairman read from "Chemistry of the Garden" extracts on soil and its life. It was resolved to arrange for holding a show of products of the district next year.

Quorn, November 7.

Present—Messrs. Thompson (chair), Cook, Toll, McColl, Smith, Venning, Finlay, Patten, Rowe, Herde, Brewster, and Noll (Hon. Sec.).

Question Box.—A number of questions were asked. One member would like to know from those who have used locally made mineral super whether it causes the crop to blight off more in hot weather than the imported super and another asked whether manured crops are more liable than unmanured crops to rust. Mr. Rowe asked the cause of rust, and at what stage does it do most harm; also cause of grainless heads in the crop. Members knew rust was caused by a fungus and that the injury depended to a large extent upon the weather. Grainless heads were attributed to lack of moisture and frosts following dry spells.

Standard Sample of Wheat.—Members considered that there would be a lot of pinched grain this season; also that it was premature to express any opinion respecting the standard sample for 1903-4. Members were of opinion that all wheat testing scales should be tested and stamped by the Government.

Amyton, November 5.

Present—Messrs. Kelly (chair), Jos., Wm., and Walter Gum, Gray, Wheadon, Hughes, Mullett (Hon. Sec.), and five visitors.

Ice Plant.—This weed is not known in the district, and members could not express any opinion as to whether it should be declared a noxious weed.

Lessons from the Drought.—Mr. Jos. Gum read a paper on "Lessons to be learned from the Drought." The drought just passed through had really extended over a period of nine years in the northern districts, with complete failures during two seasons. It was more severe and of longer duration than any previous drought since the opening of these areas thirty years ago, and as a whole it was probably the most disastrous drought ever experienced in Australia. He could, perhaps, bring forward nothing new, but simply reiterate that it was absolutely necessary during the years of plenty to provide for the lean years that were almost sure to come, as this portion of the State always had been, and probably always would be, subject to periods of drought. If the country was to be held by farmers and worked successfully it could only be by the exercise of a large amount of prevision and forethought. Every farmer should make it his business when he got a good season to secure a sufficient supply of fodder for his working stock for at least two years. This should be done by cutting as much hay as possible, by saving the cocky chaff, and by gathering and stacking as much straw as possible. If the binder and header or thresher can be used a large area of crop can be cut earlier than if stripped, and the straw would be of considerably more value. Another important matter was to always hold back sufficient wheat for seed for two years until they knew whether they would reap seed for the following year. In keeping wheat on hand for the second year's seeding, the farmer will rarely suffer loss, as if he is in a position to dispose of it later on he will nearly always get a better price for it just before the harvest than he could just after harvest. Besides this, if he fails to reap seed he saves a lot more than the wheat he has kept would have fetched, as when there was a general failure of the crops in the outside country wheat was about twice as dear as in ordinary seasons. Notwithstanding these precautions farmers will at times be at their wits' end to know what to do in a year of total failure, and most likely they would have to remove their stock elsewhere for a time; but, with seed wheat and sufficient horse feed to put in another crop, they would feel the effect much less than some of them had done of late years. Farmers in these areas should also endeavour to obtain land, even if only a small area, in a more reliable district, to work in conjunction with their other land. It was also worthy of consideration whether it would not be possible to use the agricultural motors to largely replace horse stock.

Onetree Hill, November 5.

Present—Messrs. J. Bowman (chair), G. Bowman, Barritt, Blackham, Gould, W. and E. A. Kelly, Thomas, and Clucas (Hon. Sec.).

Noxious Weeds.—The difficulty of dealing effectively with noxious weeds was referred to. Members considered it desirable that the appearance of any new weed in the district should be reported at once to the Branch in order to ascertain what it was. The importance of individual effort on the part of landowners in preventing the spread of these weeds must not be lost sight of.

Sheep.—The practice of a member undertaking to answer questions on a branch of rural industry in which he possessed special experience was again adopted with success, Mr. E. A. Thomas dealing with sheep. He stated that generally sheepowners started breeding from two-tooth ewes, and no danger was incurred in doing so, though for stud stock or extra quality sheep he advised keeping their choice Merino ewes for another year before breeding from them. This, however, was largely a question of development. Some breeds developed earlier than others, and could with advantage be bred from earlier. Moderation must be practised if two-tooth Merino rams are used, even if they are well developed. Mr. Thomas preferred the large-framed Merino ewe for farmers; some preferred crossbreds, and others comebacks, but such breeders would find themselves quickly confronted with the difficulty of procuring ewes suitable and regular in type. This was specially the case with the comeback, whereas Merino ewes of suitable type were always procurable. Some members pointed out that on an average the lamb from the crossbred ewe would weigh up to 40 lb. in the same time that the Merino lamb would reach 30 lb. in weight, but Mr. Thomas held that on fairly good country it was merely a question of keeping the latter, while the Merino ewe was very hard to beat for the agricultural areas. He admittted that the question of percentage of twin births might depend largely upon the matter of breeds, but held that more depended upon feed; flush of feed during the time the rams were with the ewes was the principal cause. He advised buying ewes for breeding purposes on limited areas, as except on large runs ewes could not be profitably raised. Much depended on the feed as to the number of rams required for the flock, and the larger the paddocks the more rams necessary. He did not consider there was any special danger of losses with Merino ewes mated to Shropshire rams, and this was borne out by a member who stated that he had had 1,700 ewes mated in this way lamb without unusual losses. In dealing with the merits of Shropshire, Down, and Dorset Horn sheep for farmers he placed the Shropshire first, having proved their excellence. He had little experience with the Down, but it was a smaller sheep: still it might find favour for crossing with the large-framed Merino. The Dorset Horns matured early and were well grown. In preparing the clip for market even small lots will pay to get up carefully, but "star" lots should be avoided. As a rule the large buyer will not trouble about them. After Mr. Thomas had answered all the questions asked a conversational discussion on sheep took place. It was pointed out that sheep were partial to certain spots especially on the warm, sunny slopes, and would often neglect luxuriant pasture not so situated. Cattle do well on pasture after sheep, turning their attention to neglected food, and allowing the bare patches to recuperate. A member stated that he had run the cultivator over rough country quite devoid of vegetation, and it was astonishing to see the way the country has recovered. Another member had manured turnips with super. and the growth of clover afterwards was very good.

Forster, November 6.

Present—Messrs. Bolt (chair), Haydn, F., J., and John Johns (Hon. Sec.), and three visitors.

Wounds on Horse's Leg.—Members wished to know how to treat wounds on joints caused by wire.—[First cleanse the wound by bathing well with warm water, then apply a weak antiseptic, and, if not very deep, put on a little Stockholm tar to keep the flies away. The wound should not be left exposed to the light.—Ed.]

Whiteheads and Takeall.—Members stated that many acres of wheat in this district were valueless owing to the quantity of "whiteheads," *i.e.*, ears without any grain therein, or with fully-formed but shrivelled grain, the plants being destroyed by some disease.—[We would be glad if members of Branches would forward samples of wheat affected by either "whiteheads" or takeall. A few plants, in different stages of the trouble, if possible, should be dug up, and the soil shaken off the roots.—Ed.]

Arthurton, November 6.

Present—Messrs. Hawke (chair), Crosby, Welch, Rowe, Pearson, Lamshed, Short, Northey, Palm (Hon. Sec.), and visitors, including Mr. R. A. Montgomery, of Dowlingville Branch.

Licensing Stallions.—This Branch is opposed to the proposed tax on stallions.

Homestead Meeting.—Members met at the Chairman's residence, for the purpose of inspecting his experimental plots. Mr. Hawke has for many years been raising and testing wheats with a view to securing good, all-round varieties, and his efforts, as shown in the crops, have been very successful. The water supply to the house, stables, &c., came in for special notice, as did the hayshed, capable of holding 250 tons of hay.

Harvesting.—A long discussion took place on the question as to the most economical way of harvesting the crops. Members generally were of opinion that the use of the complete harvester and the binder immediately after to save the straw would prove the cheapest in the long run. If the straw is cut with the binder immediately after reaping, a nice stack of clean straw can be secured for use in dry seasons.

Bute, November 3.

PRESENT—Messrs Trengove (chair) Gitsham, Sharman Schroeter, McEvoy, Ebsary and Masters (Hon Sec)

ICE PLANT—It was resolved that in the opinion of this Branch the weed known as ice plant" should be proclaimed a noxious weed and its eradication enforced by the District Councils throughout the State Mr Brideson stated that he knew places in the Port Germein district where this weed had spread to such an extent as to make the land worthless At present he believed a few plants were growing in different gardens in this district but in view of the danger of their spreading the owners should be compelled to root them up and burn them

SEED WHEAT —Dicussion took place on the selection and treatment of seed wheat Mr McEvoy considered that exposure to rain while in the heads lessened the germinating power of the grain and the farmer should therefore give first care to his seed wheat cleaning and bagging it as quickly as possible after stripping For heavy, rich land he favoured White Tuscan and on lighter and poorer soil he would sow Gluyas or Steinwedel Mr Ebsary liked to let his wheat for seed get thoroughly ripe before it was stripped He preferred Gluyas and Marshall's No 3 wheats for this district The former should be seeded heavier, as it did not stool so well as many wheats Mr Schroeter found that crops from wheat kept over a year ripened about two weeks earlier than from new seed The Hon Secretary urged the necessity for greater care in the selection of seed wheat He found Steinwedel the most profitable to grow on a limited area The rest of the land he would sow to Gluyas or Marshall's No 3

Crystal Brook, November 7.

PRESENT—Messrs R Pavy (chair) Townsend Miell Hutchison, Hamlyn, Davidson and Symons (Hon Sec)

NORTHERN CONFERENCE Members favour holding the annual Conference of Northern Branches of the Bureau at Gladstone next year

ICE PLANT —It was resolved to recommend that this weed be proclaimed under the Noxious Weeds Act and that its destruction should be enforced

Cradock, October 31.

PRESENT—Messrs Ruddock (chair), Marsh, Solly, Graham, Garnett Symonds Gillick and Iredell (Hon Sec) and one visitor

HARVEST —Discussion on probable yield of wheat for this district took place Prospects are not so favourable as they were a few weeks previously, and the average was generally put down at a bag to the acre

BEST WHEATS —Considerable discussion took place on the best wheats to grow in this locality The following varieties were recommended by different members Smart's Early, Steinwedel Allora Red Straw Purple Straw, King's Early, and African Bearded Mr Symonds pointed out that there was a difference between Smart's Early and Smart's Pioneer the former was the better variety for this district Mr Gillick said that under their special conditions the wheat that produced the most straw was the best to grow

CATTLE DISEASES Mr Gillick complained that diseased cattle had been permitted to enter the State from Queensland to the danger of their own herds Recently cattle suffering from pleuro crossed his run at Parachilna and a number died on the way He had at once brought the matter under the notice of the Department, and action had been taken to deal with the herd, but it did not seem to him to be the proper thing to allow diseased cattle to come into the State in that way

HORSE COMPLAINT —Mr Gillick had noticed horses, especially young stock, on soft, sandhill country, suffering from some complaint in the legs They seem very tender in the feet and lose strength in the legs Some affected animals had died Mr Solly thought some form of blood poisoning the cause Dealing with new collars for horses, Mr Garnett advised soaking them first in water, so that they shape themselves to the shoulder and fit the horses comfortably

Inkerman, November 3.

Present—Messrs. C. H. Daniel (chair), W. and D. Fraser, Kennedy, Lomman, Smart, Mugford, Sampson, C. E. Daniel (Hon. Sec.), and two visitors.

Green Fodder for Pigs.—The Hon. Secretary reported that he sowed broadleaf and white mustard and rape mixed in a paddock for his pigs. He found the animals left the mustard alone, but had eaten all the rape.

Harvesting Wheat Crops.—Discussion on this subject took place. Mr. W. Fraser considered the cost of the complete harvester too high. He would prefer a lighter form of the stripper with wider combs, and a simpler and more effective thresher in the concave. In harvesting the crop the great point was to get it off as quickly as possible after it was ripe, and he held that the stripper could do this more rapidly than the harvester. The chaff carriers on the latter machines were not a success, and in this district it was essential that the wheat chaff be saved. Mr. Smart thought a portion of the crops should be harvested with the binder, as they could start earlier than with either stripper or harvester, and the straw would be a valuable standby. Several members referred to the value of the binder in cutting rusty crops before the grain was too pinched. Four of the members condemned the header, as having proved a failure, besides which the cost of harvesting with binder and header was against it. Several members thought that if a steam thresher could be hired this method of harvesting could well be utilized for a portion of the crop. All present considered that for the bulk of the crop the stripper was best for this district.

Port Elliot, November 21.

Present—Messrs. McLeod (chair), Gosden, Pannel, Brown, Inglis, Hutchinson, and Hargreaves (Hon. Sec.).

Rust-resisting Wheats.—Circular from Department of Agriculture on this subject was discussed, and it was resolved that members report their experience with rust-resisting wheats at January meeting. Members are of opinion that the compilation of a list of rust-resisting wheats as proposed by the Department should be of great value to farmers, and trust that all the Branches will assist in the matter. The Chairman read from November issue of *Journal of Agriculture* paper read by Mr. Binney on wheatgrowing at meeting of Willunga Branch.

Shorthorns as Jersey Cattle.—A good discussion on dairy cattle took place. Some members favour the Jersey-Shorthorn cross, but the majority considered the pure Shorthorn best. The pure bred Jersey is considered to be too delicate for this district.

Cherries.—Members wish to know what class of soil was best suited to growing cherries. Complaint of damage by curl leaf of peaches and nectarines was general.

Willunga, November 7.

Present—Messrs. Blacker (chair), Richards, Pengilly, Kernick, Valentine, Manning, J. and W. Binney, and Hughes (Hon. Sec.).

Wheat Experiments.—Members met at Mr. Jno. Binney's residence for the purpose of inspecting the crops. Some of the paddocks will yield magnificent crops. Cape barley was considered good enough for 40 bushels per acre, while a paddock of White Tuscan wheat was estimated to yield 30 bushels or over. The crop was fully 5 ft. in height, thick and clean. Portion of the paddock had been in fallow two years, and the benefit was seen in the thicker and taller growth. The currant vineyards, orchard, and poultry yards were also inspected, and members then visited Mr. W. J. Blacker's farm to inspect results of experiments with manures supplied by the Department of Agriculture. Barley on fallowed land was estimated to yield 30 to 35 bushels per acre, while portion of the same paddock not fallowed will not yield more than 20 to 25 bushels. Some Marshall's No. 3 wheat promises a yield of 25 bushels per acre. Generally the yields in the district will be good, there being many hay paddocks yielding 3 tons per acre. There will probably be more wheat reaped in this district this season than for many years past.

Orroroo, November 13.

Present—Messrs. Moody (chair), Jamieson, Roberts, Opperman, Lillecrapp, Brown, Robertson, and Tapscott (Hon. Sec.).

Varieties of Wheat.—Several varieties of wheat were shown in the ear, and some discussion ensued. It was resolved that at the first meeting after harvest members bring cleaned samples of grain of the various wheats grown by them.

Malting Barley.—The Hon. Secretary wanted to know what variety of barley went by the name of malting barley.—[There is no special variety of malting barley, though Chevalier is generally regarded as the best. Other varieties used are Duckbill, Battledore, English, Cape, etc.—Ed.]

Mount Remarkable, November 5.

Present—Messrs. Challenger (chair), Jorgensen, Karger, T. P. and G. P. Yates, McIntosh, Morrell, Casley, and O'Connell (Hon. Sec.).

Ice Plant.—Members reported that this weed was not known in the district.

Ploughing.—Discussion on this subject took place. Messrs. Casley and Jorgensen advocated deep ploughing. Mr. Challenger would plough deeply and follow with skim plough. He advised not to plough, scarify, or harrow the same way each time. Mr. T. P. Yates stated that he ploughed his land deeply one year, but the crop was not good, the next year, however, he got the full benefit, and he was sure deep ploughing in good land paid. Mr. Karger believed in deep ploughing except on stubble land and in dry years. All members were against dry ploughing, which should be avoided whenever possible.

Millicent, November 2.

Present—Messrs. Stuckey (chair), Harris, Warland, Oberlander, Crouch, Varcoe, Campbell, Hart, and Davidson (Hon. Sec.).

Weeds.—Sorrell was reported to be very bad this year on the high lands. Mr. Hart advised shallow summer cultivation to get rid of it. A large variety of the common buttercup is also spreading considerably in this district.

Metric System of Weights and Measures.—The Hon. Secretary read a paper on this subject, explaining the ease and simplicity of calculation, as compared with their present cumbersome system. To buy or sell and calculate by the 100 lb. or multiples thereof would be very much simpler than the present system of quarters, hundredweights, tons, etc. The same applied to monetary calculations. The metric system was adopted in all European countries except Great Britain and Russia. Several of the members supported the Hon. Secretary's advocacy of the metric system.

Shorthorns as Dairy Cattle.—The Hon. Secretary called attention to Professor Towar's remarks at Congress on this subject. In the opinion of members the Shorthorn had proved the most profitable cow for general purposes in the South-East, while the Shorthorn-Jersey cross was the nearest to the ideal dairy cow. The evident discrepancy in the weights given by Professor Towar of the Holstein and Jerseys was also referred to. Some members favoured the Shorthorn-Ayrshire cross for general purposes.

Co-operation.—Mr. Campbell read a lengthy paper on "How will Co-operation suit the Local Farmer?"

Kapunda, November 7.

Present—Messrs. Shannon (chair), Weckert, Flavel, Banyer, Teagle, Morris, S. A. and G. Harris (Hon. Sec.).

Red Rust.—Some discussion on this subject took place. The Chairman had Steinwedel and King's Early rather badly affected, but there was very little rust on Marshall's No. 3. Bluey (Dart's Imperial) was quite clean, but the early sorts generally seemed more affected. Mr. Weckert had Collins' Prolific slightly affected, more so than Bluey or Purple Straw. Marshall's No. 3 was affected slightly on the flag, but Smart's Early was not affected. Mr. Harris had some selfsown Marshall's No. 3 wheat with ears 8 in. to 9 in. long.

Renmark, November 5.

PRESENT—Messrs. Showell (chair), Geniste, Huggins, Johns, Kelly, Cole, Water, and Evans (Hon. Sec.).

HAILSTORMS.—In view of the frequency of hailstorms in this locality, and the necessity for adopting, if possible, some means of combating them, it was resolved that the Hon. Minister of Agriculture be asked to obtain full particulars of the measures taken in Austria, France, and Italy to lessen the damage by hail.

RINGBARKING SULTANA VINES.—Mr. Showell gave a short account of methods and results of ringbarking Sultana vines. So far, his experiments went to prove that the operation was more effective if made before the vines blossom, differing in this respect from the currant vine. The cinctured vines set their fruit to perfection, the berries being as closely packed together as Sweet Waters.

Caltowie, November 2.

PRESENT—Messrs. Graham (chair), J. G. Lehmann, Kerr, Potter, Petatz, Neate, Connor, Jettner, and F. Lehmann (Hon. Sec.).

WHEAT DISEASE.—Members reported wheat going off in patches just as the crop was turning colour. Some of the members attributed it to a disease, others blamed the hot winds.

BREAKING IN HORSES.—Discussion took place on best age at which to break in young horses. Mr. Kerr did not approve of their being broken in until they were three years old., Young horses were often injured by being broken in too early. Mr Neate would break in a horse at two and a half years old, and put it to light, steady work, as it would then be fit at three years for more regular work. Most of the members, however, agreed with Mr. Kerr.

Naracoorte, November 14.

PRESENT—Messrs. Forster (chair), Williams, Attiwill, McLay, Wardle, Buck, Duffield, Caldwell, Coe, Cotton, and Schinckel (Hon. Sec.).

SHEEP TICK.—Some discussion took place on this subject, it being stated that tick was more prevalent this year than usual. The necessity for dipping all flocks after shearing was mentioned, and some difference of opinion existed as to whether owners were compelled to dip their sheep unless the flock was infested with tick. [The law only compels owners to dip their sheep if tick exists in the flock. ED]

EXPERIMENTAL PLOTS Members met at the Hon. Secretary's farm for the purpose of inspecting plots of Gallant wheat put in with different kinds and quantities of manure The crop, on the whole, was looking splendid, and considerable differences were noticeable in the growth on the different plots. Although rust was prevalent in some of the crop, Gallant wheat was quite free. Some discussion took place on results of experiments and also on after effects of manures. It was stated that the star thistle did not do so well on the manured land while the grass on the other hand was greatly benefited. Splendid crops of wheat and barley were noticed on a sandy hillside, where formerly there was nothing but ferns and stringybark trees This land had been cleared and manured with 1 cwt. of super per acre. The crop was sown in February and continually fed off until July. Portion was cut for hay, and yielded 30 cwt. per acre, while the balance promised a very heavy yield of grain Other matters of interest came under notice, and after the inspection the visitors were entertained at tea.

HAYMAKING.—Mr Williams read a paper on this subject. He considered the best time to cut hay was when the crop was just a little on the ripe side, as it can be stooked and stacked sooner and the hay is sweeter than if cut on the green side. If cut too green there is risk of bitterness and heating in the centre of the sheaves. This was more in connection with oats than with wheat. He prefered to stand the sheaves up in the stooks, though the practice adopted by many near Adelaide of building the stooks on the flat doubtless helped to keep out the rain.

Yorketown, November 14.

Present—Messrs. Correll (chair), Koth, Bull, Domaschenz, Jung, Lloyd, Latty, J. and A. E. Anderson, and Newbold (Hon. Sec.).

Manuring Mangolds.—At previous meeting the Chairman stated that he had grown mangolds very successfully with the aid of phosphates. He mixed a small quantity of slack lime or Thomas phosphate with mineral super, and then sowed seed and manure with the drill in rows about 2 ft. apart. His reason for mixing the manures was that the lime would combine with any excess of free acid in the super and would thereby prevent any injury to the seed or young plant in contact with the manure.

Rust-resisting Wheats.—It was decided that members bear in mind the request of the Department of Agriculture in reference to rust-resisting wheats, and keep a careful note during harvest of the behaviour of the different varieties.

Broadcasting Wheat on Manured Land.—A long discussion took place on the practice of drilling in the manure early in the season and broadcasting the seed later on. Reference was made to the success attending the operation in other parts; but none of the members had tried the practice.

Holder, November 14.

Present—Messrs. Perry (chair), Rodgers, Starr, Burroughs, Vaughan, Jones, Jaeschke, and Green (Hon. Sec.). and four visitors.

Red Rust.—Members report rust in most of the crops, though some rust-resisting varieties are quite free. It was decided that members report to next meeting on behaviour of the different varieties and losses occurring from rust.

Show.—It was decided to hold a show of produce in March, 1904.

Wilson, October 31.

Present—Messrs. W. H. Neal (chair), Gill, Sexton, Crossman, Need, Nelson, W. H. Neal, jun., and Smith (Hon. Sec.), and two visitors.

Black Rust.—Discussion took place on the cause of black rust, various opinions being expressed by members. It was decided to ask the Secretary for Agriculture for information on the subject.—[Mr. D. McAlpine, Vegetable Pathologist, Department of Agriculture, Melbourne, states that the disease usually called black rust is really leaf smut, and that pickling the seed for five minutes in a solution of 1 lb. formalin to 40 gallons water will prevent the disease.—Ed.]

Balaklava, November 14.

Present—Messrs. Manley (chair), Hams, Smith, Tiller, Vivian, and Black (Hon. Sec.).

Cost of Farming.—Mr. Vivian tabled estimates of revenue and expenditure of a 1,000-acre rented farm in this locality, showing a credit of £175 on the year's operations. Rent at 2s. 6d. per acre, 10 per cent. depreciation on live and dead stock, and wages at £75 were allowed for in the estimate, and the yield was put down at 12 bushels of wheat at 2s. 6d., while, in addition, 200 sheep are credited with £80 for wool and lambs, cows £25, fowls £20, pigs £15 Members thought the profit about the average from a property worth 2s. 6d. per acre per annum as rent.

Lyndoch, November 12.

Present—Messrs. Kennedy (chair), Warren, Burge, Thomas, Schenck, Rushall, W. J. and H. Springbett, Mitchell (Hon. Sec.), and one honorary member.

Business.—The Chairman reported on visit to Mr. Warren's orchard and to Roseworthy College. It was decided to hold an exhibition of the products of the district under the auspices of the Branch.

Kanmantoo, November 6.

PRESENT—Messrs. Hair (chair), Mullins, Mills, R. and J. Downing (Hon. Sec.).

COMPLETE HARVESTER.—Considerable discussion took place on the use of the harvester. It was generally agreed that the implement possessed a number of advantages over the ordinary stripper. Up to the present it has not been used in this locality, and some members thought it would not be a success in rough and hilly country.

RANJIT WHEAT.—Mr. Hair tabled samples of this wheat from manured and unmanured land, showing a great difference in height of straw, colour, and shape of head, besides which the manured wheat was almost free from rust, while the other was badly affected. Members thought there were two different kinds of wheat, but Mr. Hair stated that there had been no change in the seed going through the drill, but the manure had run out on one round.

Strathalbyn, November 16.

PRESENT—Messrs. M. Rankine (chair), W. M. Rankine, McAnaney, G. J. and G. M. Reed, Meikle, Michelmore, and Cheriton (Hon. Sec.).

RUST-RESISTING WHEAT.—Circular from Department of Agriculture met with approval, and it was resolved that this Branch is of opinion that material benefits must accrue if farmers will interest themselves in the matter and fill in the returns. Mr. W. M. Rankine tabled four varieties of wheat in the straw, all more or less rusted. Early varieties are not exempt from attack this year.

DAIRYING.—Mr. Thomson's address at Congress was fully discussed. His remarks in reference to the home separator were approved of by members. The question of breeds of dairy cows was discussed in connection with Mr. Thomson's article in November issue of *Journal of Agriculture*, and it was unanimously agreed that in the opinion of this Branch the best dairy cow for general purposes is the first cross of the Jersey and Shorthorn but great care must be exercised not to use crossbred sires, securing a pure bred animal when a change is necessary. The Branch fully endorses Mr. Thomson's remarks on this question.

Whyte-Yarcowie, November 21.

PRESENT—Messrs. Hack (chair), Dowd, Jenkins, Pascoe, Francis, Lock, and Boerke (Hon. Sec.).

MEMBERSHIP OF BRANCHES.—It was resolved that it be a suggestion to the Department of Agriculture that the policy of limiting the membership of Branches to fifteen be altered, and that each Branch be allowed to appoint as many members as it chooses, provided that each member pays a subscription of 1s. per annum for the *Journal*. Members were of opinion that such a change would greatly increase the usefulness of the Bureau: would help to disseminate knowledge pertaining to agriculture; would enable young farmers and assistants on the farm to become members; would lessen the drawbacks resulting from having too many drones in the Branch; and would cost the Department no more than the present system. The opinion of other Branches on this question is desired.—[As Branches can appoint as many honorary members as they may consider desirable, will not this give the same results as an unrestricted number of full members? Honorary members would not be eligible to occupy the position of Chairman or Vice-Chairman, and would have to pay 1/ per annum for the *Journal*, but otherwise they have all the privileges of ordinary members.—ED.]

WHEAT DISEASES.—Members reported crops generally very clean and free from rust, though some of the late crops were slightly affected. Of smut there was very little, but Mr. Lock stated he noticed in one crop that in the wheat on dry land smut was present, but in the hollows and damp places it was absent.

SHORT WEIGHT BINDER TWINE.—Mr. Dowd reported finding bundles of binder twine deficient in weight to the extent of 2 lb. per bundle.

Hawker, November 4.

Present—Messrs. Borgas (chair), Wardle, Schuppan, Moller, Iredell, and Smith (Hon. Sec.).

Wheat Dying.—Members reported that a considerable quantity of wheat was dying off in patches instead of ripening. As the ground was still moist they thought this due to frost or hot winds.

Sore Shoulders.—Mr. Moller had a horse with very bad shoulders, and wished to know how to treat it. Mr. Iredell recommended carbolic acid or kerosine and mutton fat.

Standard Sample of Wheat.—Mr. Iredell thought the Chamber of Commerce should fix the standard earlier in the season than had been the case in past years, as a great deal of the northern wheat was always purchased on the previous season's standard. He considered this an injustice to farmers, and would like other Branches to express their opinions on the subject.

Koolunga, November 5.

Present—Messrs. Butcher (chair), Button, Lawry, Shipway, Pengilly, Burgess, Perrin, Palmer, Atkinson, Jose, Buchanan, and Noack (Hon. Sec.).

Eggs for Hatching.—Mr. R. Lawry read a paper on this subject. Poultry raisers should pay special attention to the eggs intended for the reproduction of their stock. This attention should embrace the care and selection of the stud fowls. It was unreasonable to expect robust chickens from ill-fed or overworked parents. The progeny of such will be weak and ricketty, and liable to all sorts of trouble. The fowls should be well fed and properly mated. Eggs intended for hatching should be gathered at frequent intervals during warm weather, and promptly stored in a cool, well-ventilated room. They should be marked with the date on which they were laid and the breed of the parents. Eggs for hatching do not improve with keeping, and he would not use those more than a fortnight old unless under very special circumstances. Satisfactory results may be got from older eggs, but the percentage of chicks would be less, and some would be weakly. When buying eggs for setting get them from a reliable breeder, and do not be afraid to pay a fair price for them. It is absurd to expect eggs of good pure strains at a few shillings a sitting. Eggs that have been travelled any distance should be put away, large end up, in a cool place for twenty-four hours before setting. Select only eggs sound in the shell, even in shape, free from roughness, and neither over-sized nor under-sized.

Horsebreeding.—Mr. Shipway stated in report of Annual Congress he was made to say in the discussion on horsebreeding that the farmer should not be required to pay any portion of the service fee until the mare had been served for the last time. What he said was that the farmer should pay down £1 at service, and the balance when the foal is born.

Black Rust.—Mr. Butcher called attention to report in daily papers that Mr. D. McAlpine, of Melbourne, had stated that black rust could be prevented by treating the seed. He would like to know what the treatment consisted of.—[See reply to query in report of Wilson Branch.]

Mount Bryan East, October 31.

Present—Messrs. Dunstan (chair), Thomas, Taylor, J. and F. S. Wilks (Hon. Sec.).

Horsebreeding.—Paper read by Mr. Schubert at Congress was discussed, and met with general approval, except that members think it inadvisable to break in horses before they are three years old. If broken in too young the horse's constitution is often ruined.

Cape Tulip.—This Branch is of opinion that the Cape Tulip should be declared a noxious weed before it becomes too widespread. Owing to its poisonous nature members consider this weed likely to be very troublesome unless action is taken to destroy it.—[Cape Tulip has already been declared a noxious weed, and it remains for the local governing bodies to see that the law is carried out.—Ed.]

Colton, November 14.

Present—Messrs. P. P. Kenny (chair), M. S. W. Kenny, Kleeman, Shippard, McCracken, Whitehead, Hull, and Packer (Hon. Sec.).

Business.—It was decided to ask for fuller particulars of wheat competition in connection with the prizes offered by the Royal Agricultural and Horticultural Society, as this Branch intends to compete. Each member undertook to report on experience with rust-resistant wheats. The Chairman gave an interesting account of his visit to the Adelaide Show.

Saddleworth, November 20.

Present--Messrs. Frost (chair), Bee, Benger, Eckermann, Hannaford, Leeder, Plant, and Coleman (Hon. Sec.), and several visitors.

Homestead Meeting.—Members met at the residence of Mr. G. Benger for the purpose of inspecting the crops, etc. A young orchard of about two acres of mixed fruits was well cultivated and clean, and the trees have made good growth. Apricots were fruiting heavily, and hard pruning was suggested to secure spurs on the lower limbs. Two-year-old vines promise a nice crop of fruit. Below the orchard a few acres have been planted to forest trees, red gums and a variety of cypress doing well here. A crop of Marshall's No. 3 wheat, estimated to yield 17 bushels per acre, was seen. Part was sown with unpickled seed at rate of 30 lb. per acre, and portion with pickled seed at rate of 45 lb. The unpickled seed had produced a more even crop, and the heads were better. Rust was seen on King's Early wheat, but the heads were well filled, and apparently safe from injury. Dart's Imperial and Purple Straw were seriously injured by rust. Various manures have been tried, some for the Department of Agriculture and the plots were carefully inspected. Algerian oats promised fully 30 bushels per acre. Skinless barley was also promising. Excellent crops are to be seen throughout the district, but red rust is very bad in some of the crops, Dart's Imperial, Purple Straw, and Neumann's wheats being worst in this respect. Majestic, Marshall's No. 3, Fan, Plover, Federation, Silver King, and Bobs all show signs of rust on flag or straw, but are not likely to be affected in the yield.

Clarendon, November 21.

Present—Messrs. Juers (chair), Pelling, Spencer, Hilton, Piggott, Nicolle, Phelps, Morphett, Dunmill, and Wright (Hon. Sec.), and one visitor.

Poultry.--The Chairman read a short paper on this subject. Farmers were beginning to realize that poultry raising was distinctly profitable, and were paying more attention to it than formerly. In many cases the fowls are, however, almost allowed to take care of themselves. They either roost in the open, or in dirty, draughty sheds; and, as a consequence, eggs are scarce in the cold weather, and the fowls do not thrive. The first thing to do is to provide a warm, roomy house that can easily be cleaned, and in which the whitewash brush can be used readily as often as necessary. When commencing poultry keeping, the beginner must decide whether he intends going in mainly for egg production or for table birds, or can combine the two. The space that can be spared for the fowls must be considered also in the selection of the breed. With an unlimited run, for egg production, the Leghorn, Minorca, Andalusian, or Hamburg will be most suitable. The Minorca and Andalusian are larger than the other two, and make fair birds for the table. The Leghorns are the worst of all for confined areas, as they do not thrive without plenty of exercise and amusement, and will start feather eating. For table birds the game breeds crossed with some of the heavier breeds are best. The Langshan, Orpington, and Wyandotte rank highest as all-round birds. In breeding poultry he preferred to use two or three year old birds, as they produced healthier and stronger stock than young birds. Where the older birds are not available use cockerels with two-year-old hens, or cocks of two or three years old with pullets. For egg production birds should not be kept after they are three years old, but a good stock hen may be kept so long as she lays fairly well. Do not feed spices, condiments, and so-called egg powders, especially during the breeding season, as hens that are forced in this way will not leave healthy stock. Fowls kept in confinement must have bonemeal. Good shank bones with a little meat on them should be cut up for them. This will be found very good for laying hens. Oats and torrefied barley are also very good. Chicks are best hatched in the cool weather, though hens can be safely set at any time of the year. Eggs fresh when set should hatch out on the morning of the twenty-first day, but the hen should not be disturbed too soon. When the chicks are out and dry, place the hen in a coop in a dry place, so that she cannot run about too much and tire the chicks. Chicks want neither food nor drink for about 36 hours after hatching. Hard-boiled eggs chopped fine and mixed with dry bread crumbs make the best of food for the first three days. After that bread and milk can be given, but stale, sour food must be avoided. For mature fowls feed three times a day, though they will generally do well on two meals if they have a run. Above all, cleanliness must be strictly observed throughout.

Gawler River, October 30.

Present—Messrs. Dawkins (chair), Roedger, Spencer, Kreig, Leak, and Bray (Hon. Sec.).

Fennel.—Mr. Dawkins sought information as to the growing of fennel on the sandhills.

Cows Eating Bones.—In reply to enquiry about cows eating bones, Mr. Roediger stated that if the animals were supplied with lime and salt their craving for bones would disappear. Another member advised mixing a little super in the drinking water.

Summer Fodders.—Mr. Kreig stated that last year he grew both maize and sorghum. The cows ate the former greedily, but neglected the sorghum. The former sprouted again after being fed down, and he noticed that where the maize grew he had a better crop of wheat than on the bare fallow, whereas after sorghum the wheat was a failure. Mr. Roediger found kale a splendid summer feed. He ploughed some land early in the season, sowing kale in drills early in June, and got better results than from plants raised in seedbeds and transplanted. He had tested the feeding value of maize and sorghum, and found that the former gave the better results in butter.

Haycutting.—In reply to question, members consider that in an ordinary crop a ball of binder twine will suffice for two tons of hay, but a good deal would depend upon the height and nature of the crop.

Lipson, October 31.

Present—Messrs. Potter (chair), Chas. Provis, Geo. Provis, Brougham, France, Wishart, Brown, Baillie, Carr, Swaffer, and Barraud (Hon. Sec.), and two visitors.

Wheat Samples.—Mr. Carr tabled bundles of several different varieties of wheat, showing growths of from 4 ft. 10 in. to 6 ft. in height. Mr. Brown tabled two samples of wheat, measuring 3 ft. 6 in., both of which had been fed down with sheep until July 18. Mr. Caleb Provis showed wheat ears seven inches in length. A number of ears showing a serious deficiency at the base were also exhibited. The heads had a naked appearance; in some cases nearly an inch of the backbone is bare. Members inspected Mr. Provis's crops, which are very promising. Silver King wheat on fallow land, manured with 80 lb. of super per acre, promises a yield of six bags per acre. Good crops of Defiance, Steinwedel, and Phillis Marvel wheats were also seen, the heads on the latter being very good.

Mount Gambler, November 14.

Present—Messrs. Dyke (chair), Wedd, Pick, Barrows, Kennedy, Wilson, Bodey, Mitchell, Edwards, Watson, Ruwoldt, and Norman.

Codlin Moth.—Mr. Norman called attention to alleged remedy for codlin moth. This consisted of a special liquid preparation placed in receptacles hung in the trees. He had obtained a sample of the mixture, and had caught thousands of moths. Mr. Wilson stated that he was unable to find any codlin moths amongst those caught by Mr. Norman and brought to him. It was decided to bring the matter under the notice of the Department of Agriculture.—[The maker of this special preparation had already written the Department with a view to selling his secret to South Australia; but we cannot recommend the Government to do this. Scores of these so-called methods of trapping the codlin moth have been tried, and all have proved failures, though the inventor of each has claimed his method as a great success. It is true numerous moths may be trapped, but very few indeed are codlin moths. If this latest remedy was as effective as claimed there would surely be no necessity for the inventor to look outside his own State (New Zealand) for recognition.—Ed.]

Bush Fires.—Mr. Wedd called attention to the danger of bush fires this summer owing to the quantity of grass throughout the district. He thought every one should take extra precautions against fire, and suggested that the District Councils should clear the country roads, and allow farmers and others to plough firebreaks along the roads.

Homestead Inspection.—On November 23 members made their annual inspection trip, for the purpose of seeing the condition of the crops, etc. The whole of the day was occupied in visiting various farms around Mount Gambier West, Compton Downs and the newly opened land in the Hundred of Young, a very enjoyable outing being the result.

INDUSTRY.

SUPPLIED BY THE DEPARTMENT OF INDUSTRY.

Labor Bureau.

Number of persons registered and found employment by Government Departments and Private Employers from October 27 to November 25, 1903.

Trade or Calling.	Number Registered.		Number Employed.
	Town.	Country.	
Laborers and youths	42	64	127
Masons and bricklayers	2	—	2
Carpenters	1	—	3
Painters	1	2	4
Plasterer	—	—	2
Plumber and ironworker	2	—	—
Fitter and turner	1	—	4
Enginedrivers and firemen	1	1	—
Blacksmiths and strikers	1	—	2
Moulders	1	—	—
Brassfinisher	—	—	1
Farm hands	—	—	5
Attendants (female)	—	—	1
Cooks	2	—	2
Apprentices	10	4	—
Cleaners	—	1	—
Porters and junior porters	9	5	3
Rivet boys	2	—	—
Totals	75	77	156

November 30. 1903. A. Richardson, Bureau Clerk.

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No. 6. JANUARY 1, 1904. VOL. VII.

SOME NOTES ON ALMONDS.

By GEORGE QUINN, HORTICULTURAL INSTRUCTOR.

Owing no doubt to the ease with which the fertile nuts may be conveyed over long voyages the almond was freely introduced into South Australia during the early years of colonisation. At the present time in the more sparsely settled districts the positions formerly occupied by the rude dwellings of the pioneer settlers are in some cases to be located only by the presence of specimens of this long-suffering tree. It may also be mentioned in passing that in such situations it is often accompanied by its equally tenacious companion in exile, the fig tree. In such places, while enduring half a century's neglect in active competition with the indigenous flora which has again sprung up and filled the original clearing in which the homestead stood, the almond tree lives on. Each recurring spring sees its snowy blossoms challenge the golden tints of the wattle in the race for earliness and beauty, and each succeeding summer its glaucous foliage forms no unpleasing contrast with that of the surrounding gum trees.

Setting aside such sentiments we may draw valuable information from the facts contained therein. Firstly, we note the suitability of the soil and climate for the growth of this tree; and, secondly, the longevity displayed by it under such absolute neglect goes to indicate to what a profitable age the almond might live under reasonable cultural treatment and protection. The almonds, thus far referred to are of the natural, hard-shelled types, and closer inspection points to their origin in those kinds which at the present day are grown in the South of Europe. Brought here as seeds the resulting varieties produced great variations, and the progeny from these trees have again multiplied the kinds in our gardens. Among these we find the true hard shells, possessing smooth, thick husks of flint-like consistency. Next to these come the kinds with perforated, but hard, shells; and these merge into the so-called "softshells," the carpellary coverings of which are composed of more loosely connected fibrous layers. These in turn are excelled by the "paper shells," whose husks may be wrenched asunder by the most delicate fingers. The latter class is made up almost exclusively of the varieties imported from California.

Although more fruitful and less subject to the ravages of diseases, the exigencies of climate, or the attacks of vermin, the "hard-shelled" kinds do not commend themselves to the planter in countries where the cost of labour is high. The presence of trees of the hard-shelled kinds in pretty well all those sections of this State where agriculture is attempted has led many to suppose the almond could be profitably grown wherever the rainfall supplies sufficient moisture. This, however, is not reliable evidence, as the almond produces its blooms in July and August, while the frosts of winter are still prevalent in many sections, and the abundance of blossoms yields but a fraction of its promise in fruits. Along the coastal belts, where the sea air moderates the winter's severity, and on selected lands along the valley of the Murray River, as well as in chosen spots in North and South, where frosts are not severe, and an annual rainfall from 16 to 24 inches is recorded, good crops of nuts may be expected.

Although used as a wind break the almond tree itself is much in need of shelter from the cold, cutting, south-western gales when it is grown for commercial purposes The almond is less fastidious respecting the soil in which it may be planted than it is over the climatic conditions which suround it. Almost any class of soil, ranging from a drifting sand overlying a limestone rubble, to a full-bodied loam or alluvium, with a clay bottom, will be accepted with equal unconcern, providing no stagnation exists around its roots. This is of the utmost importance if the tree is to succeed. In this State more than one flourishing almond plantation may be seen on soils where the peach, apricot, apple, and plum have gradually succumbed to the arid conditions of soil and climate.

The method of propagation most favoured consists in planting the nuts of the hard-shelled kinds during the early winter to a depth of two or three inches. A great many of the seedlings are large enough to receive buds of the desired kinds before or in the following February. The buds are inserted in the usual manner as close to the surface of the soil as convenient. These buds remain dormant until the spring, when the top of the seedling is cut off a couple of inches above the inserted bud The bud then starts into active growth, and the remainder of the stub above the new shoot is removed during the summer, so as to permit the wound to heal over and the young shoot to grow in a vertical direction. This stage of the work is usually done in a nursery bed, but some persons prefer sowing the nuts direct into the positions where the future trees will grow, and budding the resulting seedlings on the spot. In dry localities this latter method has much to commend it, as the tap-root and original root system remain intact and usually strike deeply into the soil. The land in which the almond trees are to be planted should be well prepared, and if the surface and subsoils can be loosened to a depth of about fifteen inches better results will ensue If set in plantations the trees should be placed not nearer than 25 ft from each other in any direction. If used as a windbreak 10 or 12 ft. apart will be found most suitable.

The solution of the question as to which varieties are the most profitable to grow is the primary reason why these notes have been written. Although no definite data based upon the results of facts ascertained through scientific investigation can yet be adduced to set the question of the necessity for cross-pollination beyond doubt, still it is generally believed by observant growers that larger and more regular crops are secured where the almond plantation is composed of several varieties which bloom almost simultaneously.

There can be very little doubt that much of the barrenness complained of by the owners of old plantations is due to the absence of regular and systematic pruning. In the shaping of the young trees the same rules may be applied that are found suitable with the young plum tree The main branches on those varieties possessing a pendulous, spreading habit, should be directed towards a vertical position by pruning each main arm to buds located on the upper side of the limb. On the contrary, the very erect growing sorts should be spread out at the base by pruning the main branches over side or outside buds. Generally speaking, the first two seasons after planting the annual growths should be cut back severely to stouten the framework. The third season from half to two-thirds of the length should be left upon those leaders which are retained The side laterals should be thinned out if close together, but not topped as the first fruits usually form on their extreme tips. After the fourth or fifth year there should be practically no need to prune until some of the leaders begin to show signs of stagnation and the fruit spurs upon them become stunted and barren. When this occurs such limbs should be cut back near to the main arms and the resulting growths thinned during the following summer. By this process the whole of the top of the tree may be renewed within two or three seasons, and some nuts obtained each year. A more heroic way is to cut away the whole of the branches above the secondary limbs at one operation, and where the trees are not needed for shelter this may prove the simplest method of renovation.

In Plate I. the method described above of correcting the pendulous habit of some varieties is shown, and as the tree figured in Plate IV. is the same one photographed over three years later, the accuracy of the method is assured. The following is a description of some of the so-called "softshell" and "papershell" varieties grown in this State.

"White Nonpareil" (of S.A.).—This is a small-growing tree, with a spreading, pendulous habit (see Plate II.). It rarely exceeds about 12 ft. in height. The full-grown leaves are glaucous green in colour, with a petiole 1 in.

in length, and the blade measures 3¼ in in length by 1⅜ in at the widest part, which gives it a broad appearance The tree begins to bloom about a week later than the well-known Brandis It is a most prolific bearer of nuts, which are large and possess a beautifully white soft shell, which does not readily discolour when kept The body of the nut is rounded but the sutural margin is very flat and pronounced The kernels are seldom 'double' They are flat and broadly elliptical, with a curved, beak-like point rising abruptly from the narrow end The greatest length and diameter measure 1 in and nine-sixteenths of an inch respectively The skin or testa of the kernel is ridged, and covered by rough, gritty excrescences, which give it a deep brown colour This gritty matter leaves a somewhat disagreeable feeling in the throat when eaten and certainly discounts other excellent points possessed by this variety The shell is sufficiently firm to remain uninjured after much handling or long keeping, but, as the subjoined tables will show the proportion of husk to kernel is very high Respecting its origin Mr H Wicks the well known nurseryman, writes 'The White Nonpareil originated at Felixstow Nursery as a chance seedling, and was sent out by Mr Charles Pitt about twenty-three years ago There is another Nonpareil almond in circulation here, and although the habit of the tree is similar to the white variety, the

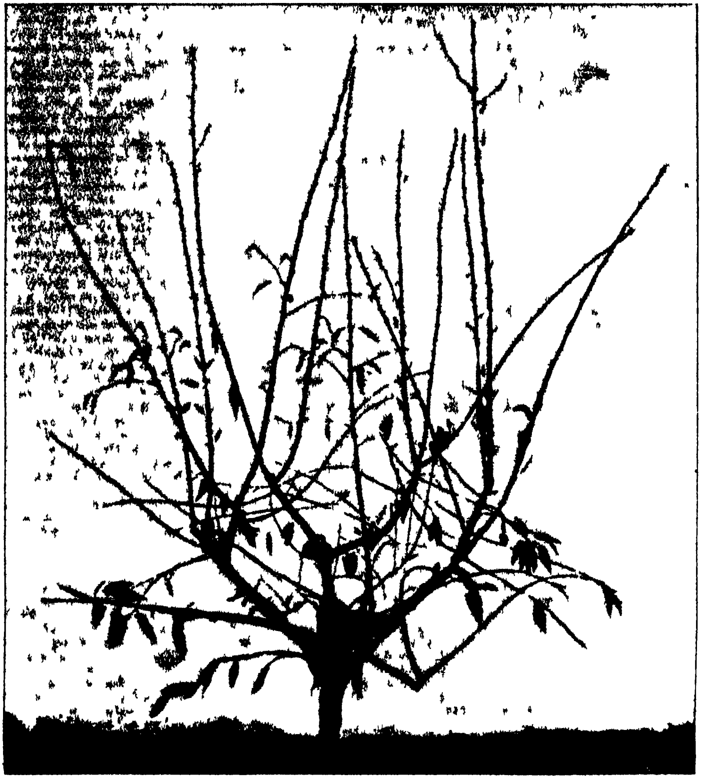

PLATE I

Young Almond, pruned to modify the natural pendulous habit of growth nut is as brown as that of the Brandis. This brown variety is a very uncertain bearer and not worth planting."

"THE BRANDIS."—This is a tall, erect, handsome tree, with a very distinctive, fan-shaped outline, as may be seen in Plate III. Its upright growth is very marked in comparison with all other locally-grown sorts. In good soils the trees readily reach 20 ft. in height. The foliage is of a dark green tint, and the fully grown leaf has a peculiarly incurved form, often hiding the midrib and showing portions of the back of the leaf. The petiole reaches a length of 1 in., and the greatest length and width of the blade is 3¾ in., by 1¾ in. respectively. It is a somewhat erratic bearer of nuts. These have a fairly regular outline, and somewhat dark brown colour upon their moderately soft but completely formed shells. The kernels are fairly large, deeply crinkled or ridged, and taper slightly to a blunt apex. The full length reaches 1¼ in., by nine-sixteenths of an inch in width at the widest part. The testa has a rich, dark brown colour, and is covered with a rough, dry, powdery substance, which, though not as prominent as that on the kernel of the White Nonpareil, is still decidedly disagreeable to the throat. Although a favourite variety with growers, it may surprise them to know that the proportion by weight of kernel to husk is decidedly disappointing. This variety is of local

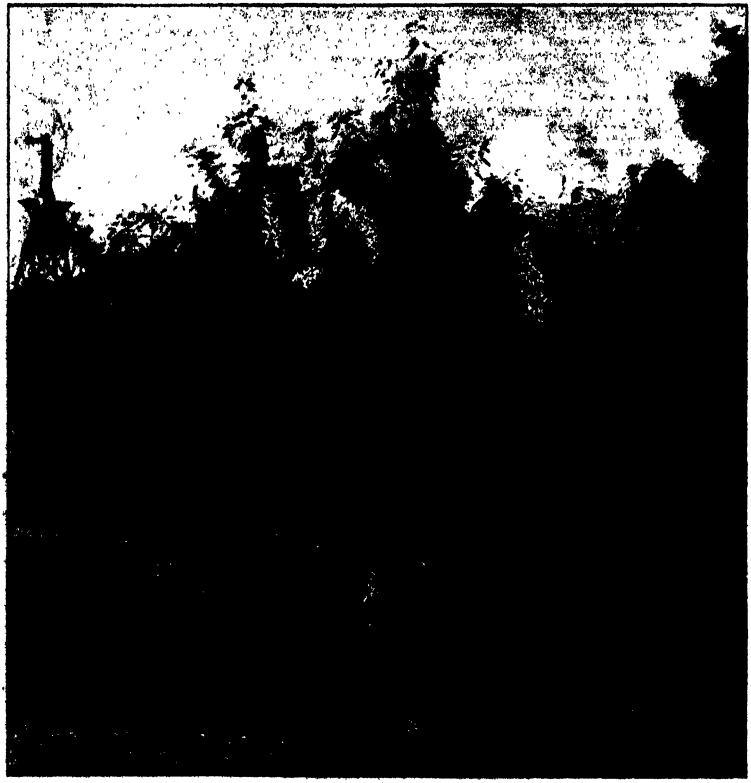

PLATE II.

Almond.—White Nonpareil of S.A.

origin, and blooms very early in the season, often in the month of July, while frosts are prevalent. Mr. J. F. Pascoe, the veteran fruitgrower of West Marden, has kindly supplied the following note respecting its history:—"It was a chance seedling raised by a Mr. Brandis who lived about four miles north of Adelaide. For a long time it was considered to be a variety of Jordan, and was catalogued as Brandis Jordan, and for many years took the prize against all comers. It evidently originated from an imported nut of the true Jordan almond."

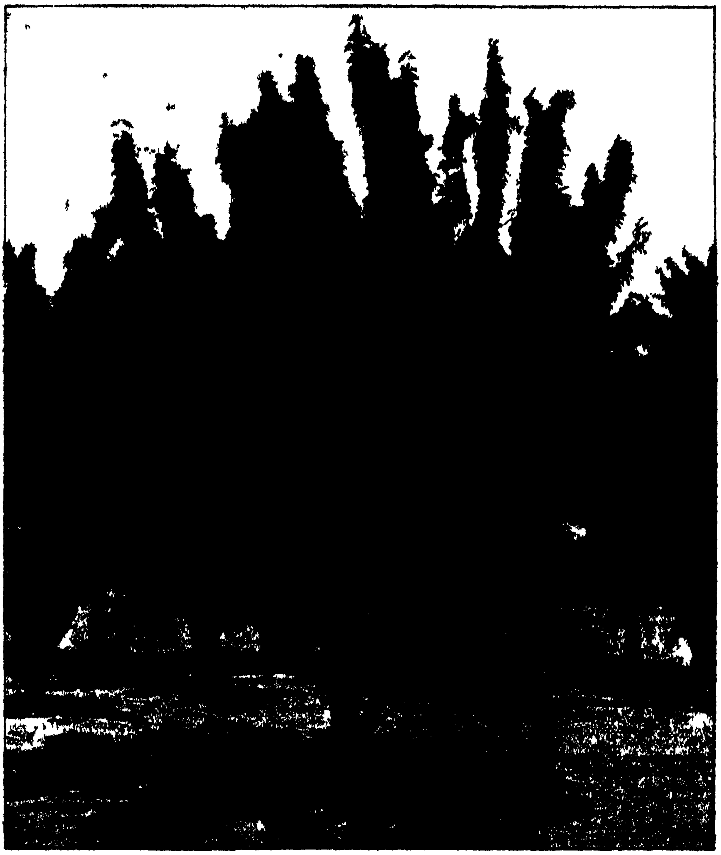

PLATE III.
Almond.—Brandis.

"NE PLUS ULTRA." This is a Californian importation where it is said to have originated as a chance seedling on the estate of Mr. A. T. Hatch, of Suisun. The tree appears to be a moderately strong grower, with a fairly erect habit. Its leaves are of a pale glaucous green colour, and are exceptionally long. The stalk is about 1 in. in length, with a blade 4½ in. by 1¼ in. at its widest part. This long, tapering leaf is a very distinguishing feature of the tree. The tree blooms about a fortnight later than the Brandis. The

PLATE IV
Almond —Californian Papershell

nuts, which are borne in great numbers, have soft but perfect shells of a pale brown colour. It is long, rounded in girth, and handsomely shaped, coming to a very artistically curved and prominent point at the small end. The kernel is long, rounded in girth, and pointed, and is of a pale brown colour. The surface of its skin is crumpled into low parallel ridges. It is slightly rough, but possesses only a fraction of the powdery grit found on the kernels of the local kinds, and which makes them somewhat disagreeable for dessert. The greatest diameter reaches seven-sixteenths of an inch, and the length one inch. The flavour is exceptionally rich and sweet. The proportion of kernel contents to the pound of nuts is higher than that possessed by either the White Nonpareil or Brandis. As a commercial nut tree this one has much to commend it.

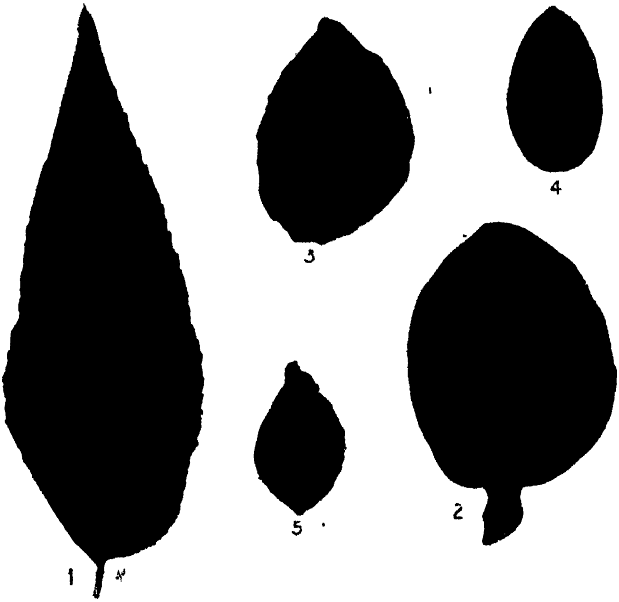

Plate V.

Almond.—Californian Papershell.

Fig. 1.—Leaf (slightly reduced). Fig. 2.—Green nut (full grown). Fig. 3.—Dry nut. Fig. 4.—Kernel. Fig. 5.—Section through widest part of dry husk. (All natural sizes.)

"The Californian Papershell."—As the name indicates, this variety hails from the Pacific State. It is very questionable whether this is the correct name, and I am inclined to think it has been confused by the importer with the "Californian Nonpareil," as the nuts tally very closely with the description of the last-named variety, as given in Californian official publications.

The tree (see Plate IV.) is of a spreading, pendulous habit, having leaves of a pale grey green colour, of great width, and more than average length, viz., leaf stalk, 1 in.; blade, 4¾ in. by 1¾ in. at the greatest width. It has, therefore, the largest leaf of the varieties dealt with in these notes. The nuts are borne in fair quantities, though not so freely as on the "Ne Plus Ultra" and "White Nonpareil" trees. The fruit is a true "papershell," and may be opened with the fingers without the slightest difficulty. A large proportion of the outer,

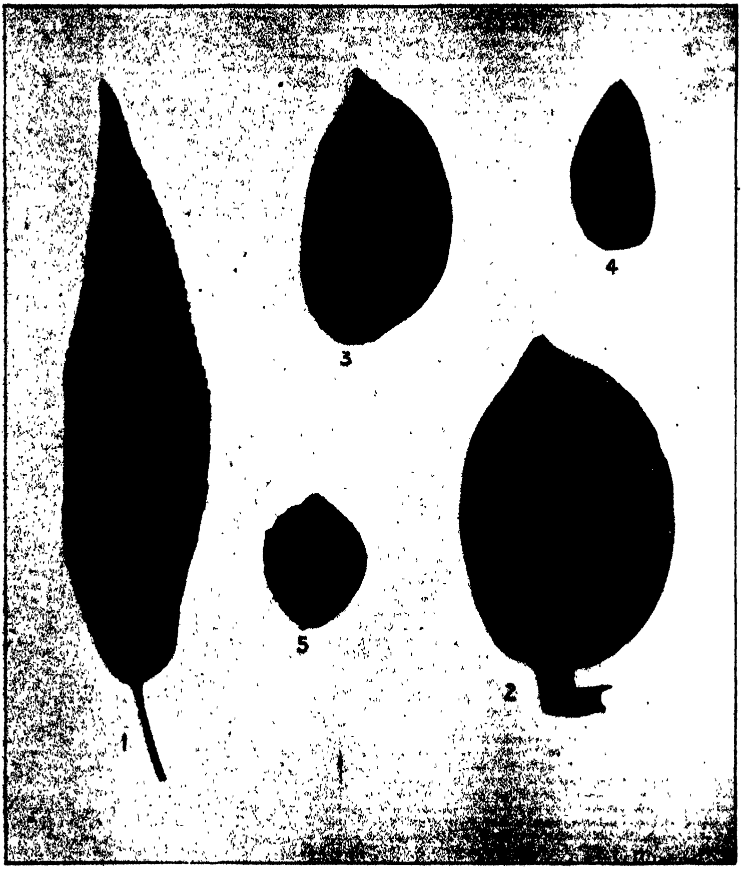

PLATE VI.

Almond.—"Ne Plus Ultra."

Fig. 1.—Leaf (slightly reduced). Fig. 2.—Green nut (full grown). Fig. 3.—Dry nut. Fig. 4.—Kernel. Fig. 5.—Section through dry husk. (All natural sizes.)

dry husk is nearly always discarded with the shedding of the green, epicarpal layer. Sometimes the inner carpellary wall (the so-called "paper" shell) is imperfect, and split along the margin of the fused suture. The kernel is of an attractive, light brown colour, the skin smooth or but slightly ribbed, and almost free of the scurfy powder noted on the kernels of local seedlings. In shape it is flat and broad, measuring nine-sixteenths of an inch in width and one inch in length, with but a gentle taper up to the well-defined point which arises quite in the centre of the top of the kernel. The proportion by weight of kernel to the pound of almonds of this variety reached 11.2 oz. It will thus be seen by reference to the attached table that it is superior in this respect to any of the others dealt with in these notes. The superior weight of kernel contents, combined with the ease with which the husks may be removed, points to

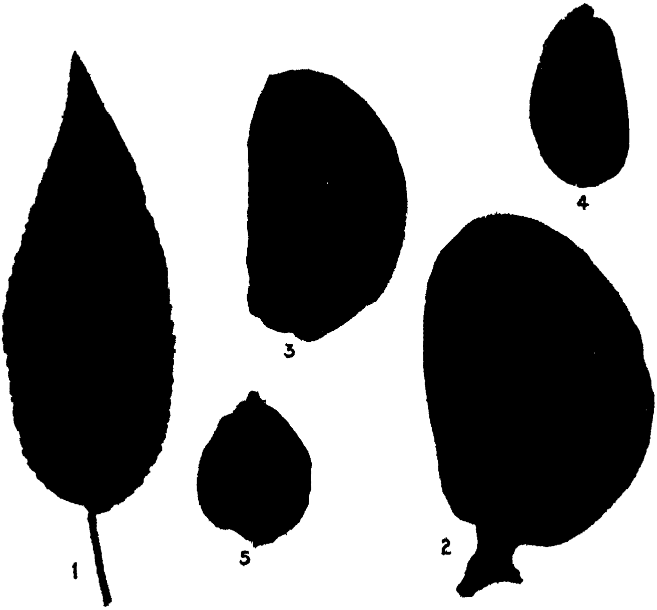

Plate VII.

Almond.—White Nonpareil of S.A.

Fig. 1.—Leaf (slightly reduced). Fig. 2.—Green nut (full grown). Fig. 3.—Dry nut. Fig. 4.—Kernel. Fig. 5.—Section through dry husk. (All natural sizes.)

this variety being especially suitable for planting in such a country as this, where the labour of shelling the nuts is a very expensive item.

The following tables show the comparative weights of husk and kernel in the four varieties dealt with. The weights were taken after the almonds had been stored nine months in a dry room, and the nuts appeared to be as dry as they are likely to become under any ordinary commercial storage.—

Variety.	Kernels in Ounces.	Husks in Ounces.
1 lb. of Californian Papershell contains	11 2	4 8
1 lb. of Ne Plus Ultra contains	9.19	6.81
1 lb. of White Nonpareil of S.A. contains	7.28	8.72
1 lb. of Brandis contains	6.81	9.19

In reference to the accompanying plates, it should be mentioned that the dry nut of White Nonpareil (Fig. 3 of Plate VII), should be very much lighter in colour than the print indicates.

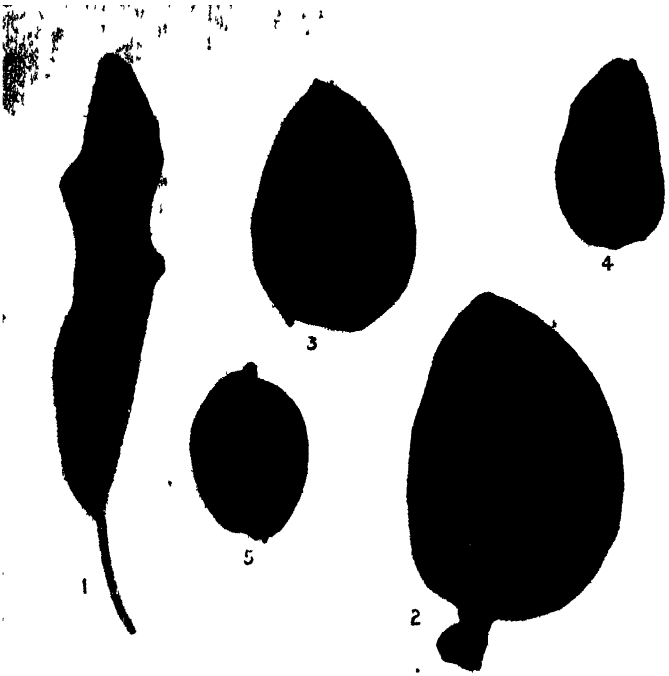

PLATE VIII

Almond Brandis

Fig 1 – Leaf (slightly reduced) Fig 2 – Green nut (full grown) Fig 3.—Dry nut Fig 4 – Kernel Fig 5 – Section through dry husk. (All natural sizes)

I beg to acknowledge the assistance of Messrs Wicks and Pascoe in connection with these notes. These growers have given me much valuable information respecting the history, time of blooming, etc, of these varieties On such matters these gentlemen have had special opportunities for making observations

(To be continued.)

AN ENQUIRY INTO SOUTH-EASTERN CONDITIONS.

By Arthur J. Perkins, Secretary for Agriculture.

(Continued from Page 307).

Stock-carrying Capacity of the Natural Herbage.

In our last issue I put briefly on record what has been the apparent productiveness of the South-East during the past seven years. No reference was, however, made to the stock-carrying capacity of the grazing area, as distinguished from the area under cultivation. It will probably be admitted that under pressure from starving stock of the drought-stricken North there has perhaps during recent years been a tendency rather to overstock the South-East than to understock it; and in consequence that statistics having reference to latter years, if they do not actually place too high a value on the natural herbage of the three counties, by no means under-estimate it. For the purpose we have in view it will be simpler to represent the various types of stock grazed by their equivalent in sheep. On the assumption that one bullock or one horse roughly represents the grazing capacity of five sheep, we find that during the seven years extending from 1896 to 1903 the 3,331,295 acres of the South-East that were purely grazed supported annually an equivalent of 1,354,870 sheep. The full grazing value of the average South-Eastern country is, therefore, represented roughly by two and a half acres to the sheep, or, more exactly, 2.46 acres. When we bear in mind the conditions already adverted to that have latterly tended towards heavy stocking, and the fact that of the sheep recorded as such a large proportion must be reckoned as lambs, we cannot but admit that in its natural state, at all events, that portion of the South-East that is not cultivated is far from being the Land of Goshen that many would have us believe. I leave for later consideration what might reasonably be expected from this land when the plough is allowed to make further inroads into it.

Bare Fallow and Other Crops Before Wheat.

The progress that has characterised our farming operations during latter years has been responsible for a curious phenomenon. There are not wanting those who, whilst cordially acquiescing in its reality, are nevertheless of the opinion that heights have been reached beyond which any further progress is highly problematic: of this the natural corollary is that we can now afford to rest on our oars. Without wishing to dwell upon the suicidal nature of such a policy in any walk of life, or even to belittle what forward steps have undeniably been made, it will suffice to point out how essentially elementary are the latter to remove any impression that any degree of finality has been reached in this direction.

In what, after all, does this progress consist? Improved soil tillage, the wider adoption of bare fallow before wheat, and the general use of superphosphates in a land characteristically poor in phosphates. Such is the limit of our advance in modern agriculture, and when it is remembered that we still continue a community satisfied, even under the best of conditions, with 10 to 15 bushels of wheat for two years' labour, the elementary—I had almost said primitive—conditions of our agriculture will be recognised. These statements are far from being made with a view to disparaging what progress has been made, or the efforts that have brought it about. The circumstances that surround the tiller of the soil are such as to render him proverbially cautious and slow in altering his methods. He is but rarely a capitalist, able to juggle with his bread and butter in frequently abortive attempts after improvement; and that for the last few years we are in a position to chronicle undeniable progress is clear evidence of the perhaps unsuspected presence of efforts out of proportion to the results effected.

Endowed with a climate so essentially different from that of the rest of the State, it was almost inevitable that in the practice of general agriculture the three counties should from the very outset diverge considerably from our recognised standards. There is, for instance, certainly more variety in South-Eastern farming than we are accustomed to, and at first sight this variety carries with it an appearance of superiority, which I fear is no more than skin deep. When variety is purely the outcome of favourable circumstances, and not the offspring of art, it cannot by itself be taken as an indication of any specially advanced form of agriculture. The test of the latter lies more in shaping and directing natural advantages towards obtaining the best possible results out of the land that economic conditions permit of. More art is required, for instance, in many parts of the State, to secure an average return of 10 bushels an acre in alternate years than to harvest yearly heavy crops of potatoes in certain favoured portions of the South-East. From the latter point of view I doubt whether the North is not ahead of the South; and if I am inclined to look to the latter for the first glimmer of a more advanced agriculture that I believe must in time spread over the bulk of the State, it is not because of the superiority of the Southern farmer, but because of the favourable natural conditions that have practically driven him along.

Whether they be fed partly to stock or wholly disposed of on the market, it is highly improbable that the cereals will ever be displaced from the leading position they occupy on our farms to-day. Other crops will probaby be grown in more or less regular rotation and fed mainly to stock. Their *rôle* in the farm economy, however, will be that of paving the way for all-important cereal crops. For the present, on the greater portion of our better farms, bare fallow precedes wheat; and, with a view to securing a better seedbed and more favourable conditions of growth, we are prepared to reap one year's crop for two years' labour. I know that it is an opinion firmly held that this practice is largely born of our special necessities, and that it is destined to outlive other changes in general practice. The discussion of the validity of this position could hardy be introduced here without a certain amount of irrelevancy. I must rest contented, therefore, with the statement that an examination of the history of agricultural practices over the world in general reveals no special connection between bare fallow and climatic conditions. As a practice the latter has come into use everywhere as soon as the fact that cereals do not advantageously follow newly broken up land had been definitely established by local experience, only to give way, however, to what we may call fallow crops, when in later times the rise in land values no longer permitted the complete sacrifice of the returns of alternate years. There is no doubt that bare fallow before wheat is of greater value in dry districts than in relatively wet ones, and in this connection the figures in Table III., setting out the relative distribution of bare fallow in the South-East and the rest of the State should prove of interest.

TABLE III.

Showing position of the practice of Bare Fallow before Cereals in the South-East, compared with that of the rest of the State, from 1896 to 1903.

SEASONS	COUNTIES MACDONNELL, ROBE, AND GREY.			REST OF THE STATE.		
	Area under bare Fallow.	Area under Cereals.	Number of Acres under bare Fallow to every 1,000 Acres under Cereals.	Area under bare Fallow.	Area under Cereals.	Number of Acres under bare Fallow to every 1,000 Acres under Cereals.
	Acres	Acres.		Acres.	Acres.	
1896-1897 .	2,115	20,062	105	510,446	1,975,076	258
1897-1898 ..	1,477	26,589	55	506,084	1,991,142	254
1898-1899 .	1,092	38,075	29	733,518	2,111,144	347
1899-1900	712	29,054	24	821,301	2,140,623	384
1900-1901 .	1,410	31,716	44	886,130	2,269,210	390
1901-1902 .	1,428	25,650	56	861,310	2,139,947	402
1902-1903 .	1,804	35,877	50	887,142	2,110,639	420
Mean of seven Seasons .	1,434	29,575	48	743,704	2,105,397	353

Results in Table III. bring to light many questions that are of interest. We find in the first place the three counties averaging during the past seven seasons 48 acres of fallow to every 1,000 acres under cereals, whilst the rest of the State has averaged 353 acres for the same area under cereals. Further, whilst in the South-East the relative proportion of land under fallow has been perceptibly falling, over the rest of the State it has been steadily rising ever since 1896; so that, whilst in the latter year to every 1,000 acres under cereals there were only 258 acres under bare fallow, in 1903 we find 420 acres. The fact that the practice of bare fallowing before cereals is steadily rising in favour in the areas north of the three counties, whilst it remains in the latter practically unrecognised, taken by itself cannot, in my opinion, serve as a standard by which the agriculture of two essentially different counties can be judged. If it can be shown that in the South-East what may be termed preparatory crops, or fallow crops, have in a measure taken the place of bare fallow, the inference may be drawn that at all events the better farmers of the district are following a practice that must in the long run be adopted by many whose farms are situated in drier districts. If, on the other hand, the absence of bare fallow in the South-East should imply that the wheat crop is sown on recently broken up pasture land, the backwardness of South-Eastern farming must be allowed. Let me illustrate my meaning If the South-East as a whole could register a regular rotation, such as the one reproduced below from the farm of Mr. J. C. Ruwoldt, one of the best farmers of the district, it might perhaps be described as a generation ahead of the North. I have, however, reason to believe that this is very far from being the case.

TABLE IV.

Showing record of Cropping of Field in Mr Ruwoldt's Farm, 1888-1903.

Season.	Crop.	Yield.
1888-1889	Potatoes	4 tons
1889-1890	Wheat	56 bushels
1890-1891	Sown Grasses	—
1891 1892	Sown Grasses	—
1892-1893	Potatoes	3 tons
1893-1894	Wheat	25 bushels
1894 1895	Sown Grasses	—
1895-1896	Sown Grasses	—
1896 1897	Potatoes	5 tons
1897-1898	Wheat	50 bushels
1898-1899	Sown Grasses	—
1899-1900	Sown Grasses	—
1900-1901	Wheat	48 bushels
1901-1902	Potatoes	6 tons
1902-1903	Wheat	48 bushels

I am well aware of the nature of the objections that will be raised to Table IV. Mr. Ruwoldt's farm is situated on the exceptionally rich soil of Mount Gambier, and can hardly be taken as a standard by which the rest of the South-East is to be weighed. To this can be answered that we have at present absolutely nothing to do with yields, but mainly with a question of policy or general practice. On Mr. Ruwoldt's farm potatoes have taken the place of bare fallow; but from a general point of view it matters little what the crop is. It might have been peas, mangolds, maize, kale, etc.; any crop, in fact, that was suited to the special district, that could be profitably utilised, and that rendered necessary summer tillage. On the other hand, the sown grasses that follow the wheat are from climatic conditions bound to continue a special feature of the South-East that few districts could copy with advantage. In another sense they certainly prepare the way for the wheat crop. They form rich pasture lands that can be heavily stocked, much to the advantage of succeeding crops. This may be gauged by the following figures, that were furnished me by Mr. Ruwoldt:—From September to February inclusive, that is to say, for a period of six months, 27 acres of grass land on his farm carried 90 sheep, 10 cattle, and 8 horses. He estimates that on the average good grass land will carry five to six sheep to the acre per annum. I am not upholding sown grasses as worthy of a regular position in a South-Eastern rotation; in fact, I suspect that some of the clovers, mangolds, and other crops might, perhaps with advantage, replace them. I am merely using facts as I find them in illustration of a possible rotation for a special district.

If the non-observance of bare fallow before wheat must in the eyes of some cause the South-East to lose caste, perhaps a comparison of the areas under other crops which may be assumed to pave the way for wheat may serve to rehabilitate it somewhat. This comparison is given in Table V.

TABLE V.

Showing comparatively the Areas under Cereals and other Crops (comprising Peas, Potatoes, Lucerne, Sown Grasses, etc.) in the South-East and the rest of the State from 1896 to 1903.

Seasons.	Counties MacDonnell, Robe, and Grey.			Rest of the State		
	Area under other Crops.	Area under Cereals.	Number of Acres under other Crops to every 1,000 Acres under Cereals.	Area under other Crops.	Area under Cereals	Number of Acres under other Crops to every 1,000 Acres under Cereals.
	Acres.	Acres.		Acres.	Acres	
1896-1897	31,451	20,062	1,568	8,497	1,950,076	4
1897-1898	25,240	26,589	949	14,278	1,991,142	7
1898-1899	26,339	38,075	692	15,652	2,111,144	7
1899-1900	28,044	29,054	965	18,673	2,140,623	9
1900-1901	26,559	31,716	837	19,392	2,269,210	9
1901-1902	27,996	25,650	1,091	20,289	2,139,947	9
1902-1903	31,199	35,877	870	21,957	2,110,639	10
Mean of seven Seasons	28,118	29,575	951	16,962	2,101,825	8

Thus from Table V we discover that if in the South-East bare fallow has been practically discarded, in the matter of other crops than cereals it easily outstrips the rest of the State. For every 1,000 acres under cereals there has been in the South-East during the last seven years an average of 951 acres under other crops, as against eight acres in the rest of the State! It is true that much of the area in the South-East under crops other than cereals is represented by sown grasses, whilst outside a few hundred acres in the Central District they are practically unrepresented in the rest of the State. Moreover, even indirectly, the latter cannot be looked upon as taking the place of bare fallow. True, when fed down they contribute towards enriching the land, but it is a matter of well-known experience that grass land cannot advantageously be broken up and put down to wheat. Between the two must come some other crop, or else bare fallow. For, like a heavy crop of stubble, the gramineous herbage, when ploughed under, has for a while a distinctly hurtful action on the soil so far as cereals are concerned. Instead of conducing, like bare fallow, to the formation of nitrates, it destroys those present or in the course of formation; it denitrifies the land. If, however, from the mean 28,118 acres under other crops we deduct 20,247 acres, the mean under grass for the same period, we still have 7,871 acres under crop, replacing bare fallow, and representing 266 acres for every 1,000 acres under cereals—a long lead over the eight acres of the rest of the State.

The above facts, therefore, furnish us with sufficient evidence as to the position of South-Eastern agriculture: favourable conditions, backed up, no doubt, by enterprise and knowledge, have placed the best farmers of the district a stage ahead of their more northerly compeers. As yet, however, but a fringe of the country has been farmed, and that generally of exceptional quality. It is the struggle with poor land or unfavourable conditions that brings to light the latent talents that all possess to a greater or lesser degree. And as new country becomes broken up we may anticipate that the efforts of newcomers may awaken to new life those who are, perhaps, inclined to slumber amidst conditions that call for no special effort in the general struggle for existence.

(To be continued.)

MANURING PASTURE LAND.

By W. L. Summers, Inspector of Fertilisers.

In our November, 1902, issue we published results of experiments carried out under the supervision of the Department of Agriculture in the direct application of manure to pasture land. Some of the experiments were unsatisfactory, various causes operating to interfere with the results. In several cases splendid returns were obtained where the manures were applied, and results generally were sufficiently promising to warrant further tests being undertaken. Our experience last year showed that, as with our wheat crops, the best results were generally obtained from the application of those manures containing a fairly high percentage of water-soluble phosphate. Two other points that impressed themselves were that the relatively open soils responded much quicker to the manure than the heavy land, and that early application was advisable.

During the past season our experiments were limited to tests with "grass manure," manufactured by the Adelaide Chemical Works, and practically the same manure with extra potash. The analyses of samples of "grass manure" show it to contain approximately: –

27.5 per cent. water-soluble phosphate.
6.0 per cent. citrate-soluble phosphate.
5.0 per cent. acid-soluble phosphate.
1.53 per cent. nitrogen.
0.75 per cent. potash.

This gives a high total of 38.5 per cent. of phosphate, and the manure is sold at £4 10s. In view of the fact that nitrogen and potash are both expensive constituents, and that mineral super alone has given good results, it is open to question whether we will not find, as we have found with our cereal crops, that under local conditions these two constituents only add to the cost without any appreciable benefits. I must admit that the previous year's results at Aldinga seemed to show that the potash was of great benefit, but this has scarcely been borne out by our second year's tests. During the coming season I hope to be able to test the matter more directly by applying relatively heavy proportions of potash. The application of gypsum alone, and in conjunction with phosphates, is also worthy of trial, as in other countries the use of gypsum has been very beneficial, especially where a fair proportion of the herbage consists of clover and other leguminous plants.

Our experiments this year in manuring grass land were carried out at Native Valley near Kanmantoo, Bordertown, Gumeracha, and Saddleworth; and the results of the tests, together with reports on the second year's results from some of our 1902 experiments, are now available for publication.

Those who look up my report in November, 1902, *Journal of Agriculture* will note that Mr. T. Pengilly, of Aldinga, secured most satisfactory returns from the application of the manures to the pasture; indeed, so well was he satisfied that the operation was a financial success that this year he dressed about 40 acres of grass land. Writing on October 27 he states that the area treated this year has well repaid him for the outlay, and that on last year's plots there has been *just as marked a difference in the growth as there was the previous year*, and any one could detect the unmanured strips from as far away as they could clearly distinguish anything. Mr. John Cheriton, of Strathalbyn, whose report last year was not very encouraging, stated in reply to my enquiry, that he was "pleased to report that the fertilisers supplied last year show a decided improvement in the herbage." He obtained from this manured pasture a prolific crop of grass, which was converted into ensilage. During the present season he manured some pasture land on his own account, and reports:—"Results are very marked; a splendid crop being cut for ensilage."

Mr. James Kitto, of Gumeracha, was this year supplied with 5 cwt. of each of the two manures previously referred to, and applied them to two five-acre plots, broadcast, at the end of April. The soil was a light, sandy loam, portion of which had never been broken, and portion had been out of crop for two years. The land is classed by Mr. Kitto as only fair grass land, and by members of the Gumeracha Branch as "mostly poor." The manure was applied at the rate of 1 cwt. per acre, and on October 20 Mr. Kitto reports a wonderful difference between the manured and unmanured land. On the manured parts the herbage was higher, thicker, and of a much better colour, and could readily be distinguished 100 yards off. There was also a marked difference in the clover, which was very abundant and strong on the manured land. The result on the unbroken soil was much better than on the land cropped two years previously, and this Mr. Kitto partly attributes to the better stand of grass on the former. With a view to reinstating the grass he is allowing it to go to seed this year. There was no noticeable difference between the results from the two manures In reply to question, "Has the extra grass paid for the manure?" the members of the Gumeracha Branch are unanimous that the application was profitable, and as results may be expected to show for several years, "manuring *must pay* at 4s. 6d. per acre." The Secretary of the Branch states that there is at least three times as much grass on the manured land as on the strips between, and as a result of the experiment many acres of grass land in this district will be dressed with manure next season.

At Kanmantoo three members of the Branch Bureau divided the manures supplied by the Department, and on September 16, in company with several of the members, I visited the various plots. This being a late district the date in question was too early to show fully the effects of the manure, but in every instance they were plainly discernible, the only question being, "Was it actually profitable?" Messrs. F. Lehmann and J. Hair had each a couple of small plots manured, while Mr. W. G. Mills had probably ten acres under experiment. The soil was mostly very hard on the surface, with rocky outcrops in some parts, and the manures were applied by means of the seed drill. It was evident that the surface was too hard, except at Mr. Mills's farm, for the manure to become properly incorporated with the soil, but the growth of clover and annual herbage along the drill marks was very strong compared with the land alongside. This was especially noticeable with respect to the clovers, which on the unmanured land were so small that it required a fairly close examination to detect them. It was noticed in every instance that where the drill crossed patches of land that had a fair covering of decayed vegetable matter from old stacks, manure heaps, or sheep camps there was a very strong carpet of grass and clover. The perennial bunch grasses which constitute such an important part of the herbage of the hills in this district had not made much growth at the time of my visit. At Mr. Mills's farm the results generally were much better, and the members were well satisfied with the benefit derived from the manure. Mr. Mills pointed out a slope on the opposite side of the gully to that on which his plots were. Running through this slope was a narrow strip of land with very scanty growth of grass, and compared with the land on either side appeared almost barren. Mr. Mills stated that this was apparently a permanent record of his first experience in the use of manures for cereal crops. Eight years previously the land was cropped with wheat, and a fair dressing of guano was applied with the drill. To test the value of the manure a narrow strip through the field was left untreated. Not only was there a marked difference in the crop, but every year since there has been this noticeable difference in the herbage. Writing in November, Mr. Mills states that on the grass-manure plots the herbage still shows a remarkable increase over the rest of the land, although the field had been grazed heavily for nearly two months. The most noticeable feature was the luxuriant growth of some small-leaved clovers which have made their appearance in the district during the past two years. He is convinced that if the manure next year shows results anything approaching this year's returns the application of manure to their pastures must prove one of the most profitable investments within their reach, as there is from two to three times as much vegetation on the manured land. Not only is there more herbage, but the increase is largely in the clovers, which are better feed, keep green longer than the other herbage, and also improve the land for cropping. The extra potash did not appear to give any benefit, as the growth was no better than where the ordinary grass manure was applied. Mr. Mills expresses his intention of undertaking further experiments during the coming season in view of the possibilities this practice presents to graziers.

At Bordertown several members of the Bureau tried the manure supplied by the Department. The manure was applied rather late, and was simply broadcasted on the land, showery weather following soon after. Mr. W. E. Fisher applied the manure on heavy clay soil and on free, sandy loam. On the heavy land there was a great improvement in the grass, while on the sandy soil the manured portion showed up as a ridge of grass, which was plainly noticeable from a long way off. Mr. P. Low applied the manure on limestone soil, and his report on results is "Very good." Mr. Thomas Spotwood dressed some wet land, inclined to be very hard in summer. Here, while the result is shown to a considerable extent, it does not equal the other plots. Again the extra growth of the ordinary wild clover is noted by those who inspected the plots, and Mr. Fisher writes:—"All agree that it will pay to manure our grass paddocks with 1 cwt. to 2 cwt. per acre, according to the quality of the land."

At Saddleworth our energetic Hon. Secretary (Mr. F. Coleman) undertook the experiments for the Department. The manure was just scratched on the surface about the middle of April on a paddock carrying good native grasses. Until the middle of June there was no appreciable difference between the manured and unmanured land, though the latter was quite noticeable. Writing in August Mr. Coleman states that there has not been the result he expected from the manure, but owing to the cold nights during July and August the grass generally had made but little progress except in sheltered places In addition to the manures supplied by the Department Mr. Coleman applied mineral super to a portion of the paddock, and states he could see no difference between the manures in their effect on the grass. Writing at the end of November Mr. Coleman states that he has 46 head of cattle grazing on 63 acres, and the grass is about 2 ft. in height. It is certainly better on the manured plots than elsewhere, but not to the extent expected. The season has been remarkably favourable to the growth of grass, and the manure might show to more advantage another season.

From a number of farmers who have tried the application of mineral super on grass land I have had generally favourable reports, and as a rule the results have more than paid for the outlay. Mr. Charles Royal, of Sharpham Park, near Mount Pleasant, advises me that where he applied super with the seeddrill to grass land of a sandy nature he got more than double as much feed as on the land alongside, the clovers also were more luxuriant. When we bear in mind that the manure not only increases the herbage the first year, but also improves its feeding qualities, and should show more or less return for several years, the importance of this question of manuring pasture land can be easily recognised. What we want now after these demonstration plots is to be able to show the result of the application of manure in pounds, shillings, and pence. In other words, we need two or three fair-sized plots of pasture land, separately fenced, and all but one treated with manure. When the herbage has made fair growth the land would be stocked according to its carrying capacity with sheep as even as possible in character. To determine the amount of gain from each plot the sheep would require to be weighed at the commencement, at intervals during the test, and at the conclusion of the test. The results would then show whether the increase in the mutton would pay for the cost of the manure, and what profit, if any, would accrue. To arrive at a fair profit and loss account of the transaction it would, of course, be necessary to extend the test over a period of three years.

From what I have seen in various parts of the State, and from the results of our experiments, I am convinced that in the course of a few years considerable areas of pasture land will be manured, and I am sure it will pay our larger stockowners to give some attention to the improvement of their holdings in this way.

DEPARTMENTAL NOTES AND WORK.

Professor Perkins recently visited Angaston district for the purpose of having a look around the currant vineyards and examining a vineyard reputed to be suffering from some obscure disease, which causes the leaves to curl up and fall. He could find no indication of any disease in the vineyard in question beyond a few leaves with an unhealthy appearance; generally the vines had made splendid growth. It is, however, stated that later in the season some of the vines lose all their leaves, and the fruit fails to come to maturity. This subject will receive further attention when the so-called disease is more noticeable. The vineyards throughout the district are looking well, and are, on the whole, kept in a good state of cultivation. There are, however, one or two marked exceptions, and it is alleged that the owners blame the unusual rainfall for the condition of their vineyards.

During December Mr. Thomson visited Yongala and Wilmington districts for the purpose of giving instruction at the factories, and at Wilmington he gave a public lecture on dairy cattle. Portion of his time has been occupied in inspecting butter for export and in teaching at Roseworthy College.

Mr. W. L. Summers (Inspector of Fertilisers) paid a visit to Yorketown during December for the purpose of arranging for experimental work in the reclamation of "salt" patches. So far as can be learned, there are several thousand acres of land in Southern Yorke's Peninsula which formerly produced good crops of wheat, but which, owing to the rise of "salt" during recent years, have become practically barren. In other parts of the State similar "salt patches" exist. The question is, therefore, of considerable importance to the State. In dealing with the "salt patches" the first thing to do is to determine which of the various salts predominates in each instance, as the treatment recommended must depend almost entirely on this factor. The cost of the necessary analyses would in each case amount to £2 to £2 10s. The Department is prepared to pay half the cost of a limited number of such analyses, and also to suggest treatment of the land, where the area affected warrants the outlay. Members of the Agricultural Bureau desirous of having "salt patches" on their land tested should first communicate with the Department of Agriculture.

The reports of Inspectors Brown and Rowell contain the following items:—During December 7,842 cases of fruits, 40 packages of plants and 3,675 packages of vegetables were inspected and certified for export to New South Wales and Victoria. During the same period 2,376 cases of fruits and 60 parcels of plants were admitted into South Australia while 10 parcels of plants were detained or destroyed owing to not possessing the necessary declaration respecting their origin, and 72 cases of bananas were destroyed owing to arriving in a ripe condition, thus raising a doubt as to their freedom from larvæ of fruit-infesting flies.

During December *The Register* published a statement, on the authority of a fruit-grower from Norton's Summit, that bananas affected by the dreaded fruit fly had been found in the Adelaide markets. As all imported bananas are examined at Port Adelaide by an officer of the Department of Agriculture this alleged discovery was made the text for an attack on the Fruit Inspectors. It is greatly to be regretted that the grower in question—who could never have seen the maggots of the fruit fly, or he would not have been guilty of the ridiculous mistake of confusing the larvæ of the common vinegar fly with that of the fruit fly—should have hastened to give publicity to a statement calculated to do so much injury to our export trade. One result of his action was that other growers took the matter up, and prohibition of the importation of bananas has even been suggested. Our growers would, however, do well to remember that there is such a thing as retaliation, and to talk of prohibition of fruit from any State without very strong grounds will only be likely to injure a trade upon which they are largely dependent. Growers may rest assured that the officers of the Department are fully alive to the necessity for careful inspection of all imported fruit, and for this reason every case that comes into the State is examined, and any suspicious fruit is condemned. Fortunately a number of the alleged fruit fly maggots were secured by Inspector Rowell at the market, and these have been hatched in the office, proving them to be those of one of the common vinegar flies which can be found in all places where decaying or fermenting fruit exists.

The following Annual Conferences of Branches of the Agricultural Bureau have been arranged:—Northern Branches, at Gladstone, on Wednesday, February 10; River Murray Branches, at Mannum, on February 24 and 25. Arrangements for the South-Eastern Conference, to be held at Bordertown; the Southern Conference, at Strathalbyn; and the Northern Yorke's Peninsula Conference have not yet been advised. It is earnestly hoped that the members of Branches will endeavour to attend the various Conferences in their respective districts, as it is very disheartening to the organisers to have only a few Branches represented. These annual gatherings can be made of considerable educational value to the producers of the State. It rests entirely with the members of the Branches whether they are made so or not.

The question of continuing to prohibit the sale of codlin moth infested fruit was considered recently in Cabinet, and in deference to the resolution passed in the House of Assembly on November 5, 1902, the Government has decided not to prosecute persons selling infested fruit during the present season. Early in the next session of Parliament the Minister of Agriculture proposes to introduce a new Bill covering the treatment of all plant diseases with the exception of the phylloxera. This Bill has been prepared somewhat on the lines of the Tasmanian Codlin Moth Act. It throws the burden and expense of its administration on Fruit Boards, to be elected by fruit-growers within districts which will be defined by proclamation. With reference to codlin moth, the spirit of the Bill is in accord with the answers given in the referendum recently taken among apple-growers. Early in the new year meetings will be called in the different fruit-growing districts with a view to considering the new Bill and suggesting alterations or amendments. Mr. Quinn will attend the meetings and explain its provisions. The Minister will then be in a position to bring before Parliament an amended Bill, which meets the views of the majority, and which will safeguard the interests of the fruit industry.

The Corn Trade Section of the Chamber of Commerce has fixed the wheat standard for the season 1903-4 at 61½ lb. to the bushel. The records of the Chamber of Commerce do not go back further than 1888, but it is stated by those engaged in the wheat trade that 61½ lb. is the lowest weight that has ever been declared for South Australian grain. The low weight this year is entirely due to the very unusual prevalence of wet weather during the harvest months. The weight of the f.a.q. sample in previous years has been as under: 1888, 64 lb.; 1889, 63 lb.; 1890, 62 lb.; 1891, 64 lb.; 1892, 63 lb.; 1893, 62¼ lb.; 1894, 63 lb.; 1895, 62½ lb.; 1896, 63 lb.; 1897, 63 lb.; 1898, 62 lb.; 1899, 63 lb.; 1900, 63 lb.; 1901, 63 lb.; 1902, 62 lb.; 1903, 63 lb.

DEPARTMENT OF AGRICULTURE.

REMOVAL OF OFFICES.

The Offices of the Department of Agriculture are now situated in the Western Wing of the Jubilee Exhibition Building, North Terrace, Adelaide.

Members of the Agricultural Bureau are invited when in town to call at the Office. The Library of Agricultural Literature possessed by the Department can be consulted by anyone desirous of doing so during ordinary office hours.

HYPERICUM PERFORATUM (ST. JOHN'S WORT).

By W. L. Summers, Inspector of Fertilisers.

This is one of a group of ornamental garden plants, known generally under the name of St. John's Wort. It is an upright, woody-stemmed plant, with small opposite leaves and numerous branches, each of which is crowned with pretty yellow flowers. The leaves on being held up to the light present the appearance of being covered with minute perforations, the green colouring matter being quite absent from these spots. In Victoria this weed has occupied large areas of land in various parts, mainly in the more elevated districts. Owing to the extent of damage to pasture by this weed, Mr. Charles French, F.L.S., was deputed by the Secretary for Agriculture of Victoria to report on the subject, and after visiting the localities where it was known to exist, he estimated the area of infested land to be nearly nine thousand acres. Mr. French states that it is now a question of eradicating this St. John's Wort, or of allowing many thousand acres of valuable land to be completely ruined.

To my knowledge the only place in South Australia where this *Hypericum* is growing wild is along the Coromandel Valley, about nine miles from Adelaide. Commencing near the Blackwood Railway Station, the weed is plentiful on the main road, and on land on either side for a distance of about two and a half miles. In places it is very plentiful, covering patches several acres in area. I believe the weed was first noticed about eighteen years ago in this locality. Apparently it does not thrive except on fairly good ground, in elevated districts with a fair rainfall, as for years past the Sturt River has undoubtedly carried millions of seeds to the plains, where the plant is practically unknown; and, besides, the poorer, sandy soil in close proximity to where the weed has been flourishing for years is almost free from it.

It is, however, slowly but surely spreading throughout the district, and it can only be a matter of time for large areas of valuable land throughout the hills becoming useless unless vigorous action is taken to destroy the weed. On the shallower soils the plant flowers when only about 18 in. in height, but in the better and moister ground it reaches a height of 2 ft. 6 in. to 3 ft. 6 in., and makes a fairly large bush. Mr. French states that in Victoria *Hypericum perforatum* grows to a height of 6 ft.

Besides smothering useful herbage, this *Hypericum* is decidedly injurious to stock. It is stated that it has a tendency to cause the cows to dry off early; it also causes skin complaints, as evidenced by the animals affected continually scratching themselves. Mr. French states that in Victoria the plant causes animals that partake of it to break out in sores. Medical botanies of early days mention *Hypericum perforatum*, various healing properties being attributed to an oily substance obtained from the flowers.

This weed has not yet been proclaimed under the Noxious Weeds Act, and there is therefore no power to compel landowners to destroy it. With the experience of Victoria in mind, and the fact that at present the plant is confined to limited areas, it will, I think, be admitted that every effort should be made now to cope with it. Under ordinary circumstances these injurious weeds generally secure a strong footing throughout the country before their objectionable characteristics are fully grasped, and their eradication then presents almost insuperable difficulties. Not always, however, is this the case. We might instance the Cape Tulip *(Homeria collina)*, the dangerous character of which was pointed out many years ago; but, unfortunately, no action was taken by Parliament when it occupied only limited areas of land, and now it has been declared a noxious weed it has full possession of many hundreds of acres. It is sincerely to be hoped that this *Hypericum* will not be similarly neglected. If any effective measures are to be taken they must be taken now while it is confined to a relatively small area.

[illegible] of eradication is [illegible] very serious one. On cultivated land there is little danger of the weed getting a hold. On arable land, however, it will prove a difficult task to dispose of it without breaking it up with the plough, as when cut up with mattock or hoe it will spring again from the [illegible] and [illegible] only a few inch[illegible] in length will flower and seed. Vigorous [illegible] efforts during the [illegible] arly summer months would, however, [illegible] the upper hand of the [illegible] ly clear land, but the fact that [illegible] in the crevices of [illegible] in the cuttings on the roads

[illegible] [illegible] OFFICE, ADELAIDE. [illegible], Photo-lithographer

puts this method of combating it out of the question in such circumstances. Spraying the plants with soluble arsenical compounds while the growth is young would probably prove the cheapest and most effective way of exterminating them. This, however, would probably necessitate keeping stock off the land for some time, though there should be very little risk of poisoning, as the arsenic would be very much diluted, and the operation would be performed early in spring, when grass is usually plentiful.

Our illustration, which is portion of the branch of a vigorous plant sketched nearly natural size, accurately depicts the general characteristics of the plant, and should enable any one to identify the plant without difficulty.

WHAT TYPE OF MILK COW PAYS THE DAIRYMAN BEST?

By G S. Thomson, F.R.S.E., Government Dairy Instructor.

Exhaustive experiments to determine the most profitable class or type of dairy cow have been conducted by the Department of Agriculture, Canada, and the University of Wisconsin, U S A.

The report of the Canadian test has been published. It sums up in favour of the grade cow, as follows:—"A grade or cross is more profitable in the dairy, as it is more profitable in the feeding court or byre, than a pure-bred. This fact is one of the great forces in maintaining the value of pure-bred stock. The breed which shows the best results when used for crossing purposes is the most valuable breed."

In the Wisconsin trials the issue of a bulletin of eighty-eight pages gives a detailed account of over four years' careful study into the merits of different classes of cows for milk and butter production and dual purposes. In all thirty-eight cows were selected from farms in the neighbouring districts of Wisconsin University, representing the pure and crossbred, Shorthorn, Jersey, Guernsey, Holstein, and one Red Poll. A thorough and careful record was kept of the feeding, milking, butter fat tests, weight of animals, in fact, nothing was allowed to escape the notebook of the experimentalists to make the results complete and of the highest value to the producer.

Type of Cows.

The following is given in explanation of the different types of milk cows in the experiment, and is well worth considering.—

"No question concerning the dairy business has occupied more of the attention of writers on dairy topics and investigators of problems connected with the economical production of dairy products during recent years than has that of the proper type or conformation of dairy cows Such expressions as dairy type, dairy temperament or tendencies, extreme dairy type, dual purpose type, beef type, and beefy tendencies in cows have been in constant use everywhere of late in discussions of the best cow for the dairy. It is well under these conditions to give some brief explanations as to the meaning of these terms as popularly understood, in order to lay a foundation for an intelligent discussion of the results bearing on this subject which have been obtained by us in this investigation. It may be said, in general, that all cows utilise the feed which they eat for one of two purposes: for the production of milk or for an increase in live weight Cows which through hereditary tendencies and environment (including feed) have developed a capacity for transforming a large quantity of feed into milk, without at the same time utilizing for an increase in live weight any of the feed supplied in excess of that required for the sustenance of the animal, are known as dairy cows. Other cows, from influences of the same character acting in another direction, have a capacity for transforming their feed very largely into flesh and fat on their bodies, and the milk produced by such cows is utilized entirely for the nourishment of their calves: these are termed strictly beef cows. We are not concerned in this discussion or in this investigation with cows of the latter class, as we have had no representative of such cows in our herd. Between these two classes we find a large number of cows that combine the characteristics of the dairy cow, in so far as a large production of milk is concerned, with those of beef cows, in that they produce calves which make profitable feeders for beef production.

Cows belonging to this intermediate class are generally spoken of as dual purpose or farmers' cows. Cows belonging to the dairy class proper, as above described, vary considerably in their conformation and characteristics, showing what is termed the extreme dairy type and a large dairy type, which may blend imperceptibly into the dual purpose type. The first of these includes small, much refined, and delicate dairy cows with a very spare habit of body. Most of such cows will be found in the Jersey, Guernsey, and Holstein breeds, and predominating in these breeds in the order named. This type of cows has been advocated very strongly during recent years as the ideal dairy cow. One of the reasons given for this position is that such cows are believed to possess the most strongly developed nervous organization, which is known to be intimately associated with a large capacity for transforming feed into milk. A careful study of the individual characteristics of cows of large dairy production, belonging to the various types, will, however, disclose the fact that all large-producing dairy cows, whether of the dairy or the so-called dual-purpose type, possess this highly developed nervous organization in a marked degree. It will also be found that cows of a decidedly sluggish temperament are often found among small spare cows which can only be placed in the extreme dairy class. It is very difficult to draw a sharp line of distinction between cows of the extreme dairy type and those of what may be termed the large dairy type, as well as between the other types that we have considered, as they naturally go gradually over into each other: but we shall presently see that there are characteristic differences in the conformation of nearly all cows that decide with considerable certainty to which type they properly belong."

FEEDING.

With a herd representing cows of different breeds and types, food varying in weight and quality was required for each animal. It, therefore, took a year before the demands of the individual cows were understood, coming as they did from different districts and where they were treated under varying conditions. During the first year certain cows in the herd maintained a normal weight and gave a large and profitable return in milk, while others receiving the same feed gained rapidly in weight and produced only a small yield of milk. The second year the system of feeding was changed in such a way that each cow was given all the hay, silage, and other rough food that she would consume, and a sufficient amount of grain mixture adapted to her inherent tendencies, to produce the largest milk flow possible without at the same time causing an appreciable increase in live weight. Stall feeding was conducted for nine months in the year, the remaining three months the cows were put to pasture. This would naturally raise the cost of feeding, and severely test the payable aspect of the experiment.

VARIATIONS IN ANNUAL PRODUCTION.

The production of the individual cows varied considerably from year to year, and in some cases these variations are due to fairly well understood causes. Of these the following are mentioned:—First. An unusually large yield during one lactation period is always certain to be followed by a relatively low yield in the next period, and, conversely, a cow is most likely to give a very large yield during a lactation period immediately following one of low production. Second. Cows which have not been highly fed or forced by heavy grain feeding are likely to respond with a larger production during their first lactation period under improved conditions of feeding than they will in later lactation periods under similar conditions. Third. The influence of long-continued liberal feeding will in many instances bring about a development of the productive capacity of cows, and a gradual increase of production in the course of a number of years will be obtained even when there may be a considerable variation above and below the average from year to year. This is observed particularly in the case of young and middle-aged cows, as shown in the production from cows during successive years. Fourth. Marked variations in the production of individual cows from year to year may be caused by attacks of various diseases, like milk fever, garget, retention of afterbirth, or by accidents.

The Wisconsin experiments show that it does not follow that a small amount or a low cost of feed is always accompanied by a low yearly production. In many instances a higher production was obtained from a smaller amount of feed, or at a lower cost, or *vice versa*. In the case of two cows, the lowest production for the four years was obtained during the first year, when they ate the most feed. One of the two cows produced 42.64 lb. less butter fat than she did the second year, and her food cost $5.42 more. Another illustration shows that the cost of feed for a cow when three years old was $30.97 for 350 days, the following year $29.87, while her yields of butter fat during the two years were 98 and 302 lb. respectively. For the first year, 1898-99, she was kept at a loss of $15.92. In 1899-00 she returned a profit of $47.35 over and above the cost of feed.

The causes accountable for these changes were the thin condition of the cows at the commencement of the test, and with heavy feeding the first year they were adding weight, and next year responded in milk and butter fat. But a continuation of the rich and abundant supply of feed went too much to flesh, and decreased in production along dairy lines.

THE HONOURS LIST.

A pure-bred Jersey and grade Shorthorn came out best in the four years' test, with a net annual profit of £16 approximately for milk and butter fat. The second pure Jersey on the list gave £14, and the second grade Shorthorn £13. Jersey No. 1 and 2 weighed 802 and 780 lb. respectively, while the two Shorthorn grades scaled 1,185 and 1,118 lb.

THE MOST ECONOMIC COW.

From the data presented and everything considered, says the report, cows representing the large dairy type are clearly in the lead for economic production of milk and butter fat. The results of over four years' work with cows of the extreme dairy type (Jerseys) not only failed to establish the claims for the superiority of cows of this type over a much larger and apparently stronger dairy type, but clearly show that they are not as large producers, nor as profitable dairy animals, as the latter.

"That the extreme dairy type has been popular, at least in this State, is evinced, among other reasons, by the fact that three of the cows selected for the University herd at our solicitation by prominent dairymen in our State were fair representatives of this type of cows. Our investigations have been conducted under the most favourable conditions possible for this type of cows. The stable in which they have been kept is considered a model one as regards cleanliness, light, ventilation, and general comfort of the animals. Water is provided for them in the stalls, so that they are not exposed to inclement weather at any time. They are given the best of care and attention at all times, being fed liberally, kept during the hot, summer months in the cool, darkened barn, protected from sun and flies, and fed on various green feeds and grain in summer, as well as protected from extreme cold in winter. In view of the ever-increasing demands on the part of dairymen for cows that will have endurance and ability to withstand disease as well as great productive capacities, we do not hesitate to state that in our opinion it is not the part of wisdom for our dairymen to select the small, refined cows, with a spare habit of body in an extreme degree, as the most desirable type of dairy cow. It has been shown that the Shorthorns ate smaller amounts of grain feed as well as roughage, in proportion to their average live weights, than did the representatives of any of the other breeds, the Guernsey coming second, while the Holsteins and Jerseys are very nearly equal, with a slight difference in favour of the Jerseys."

Attention is called to the fact that all large producers among the cows show remarkable uniformity in their great depth and length of body, and in their large and strongly built frames, both of which characteristics are indicative of great digestive capacity and power.

Speaking of the dual-purpose cow, the Wisconsin tests point out that the dairy farmer must not expect the greatest profit from them in the proportion of milk and butter fat. It is clearly evident, however, writes the bulletin, that cows of this class will return a large profit over cost of feed consumed in the shape of dairy products, leaving out of consideration the superior value of their calves for beef production. For the dairy farmer, however, the large type of dairy cow, and the particular breed suiting his fancy, and weighing, say, 1,000 lb. or more, will, we believe, everything considered, be found the most satisfactory.

OUR MILKING STOCK.

By G. S. Thomson, F.R.S.E., Government Dairy Instructor.

The much-debated question of milking stock, brought before the meetings of the Agricultural Bureau during the past few months, has elicited sound criticism of the system of stock-raising practised on some dairy farms in South Australia, while it has at the same time testified to the good work done in all districts in the improvement of our dairy herds.

It is gratifying to hear how favourably impressed farmers are with the Shorthorn breed and its crosses, and I have not heard one contrary expression against the popularity and usefulness of the world-famous Durham. Keen interest has been centred in the discussions, and marked intelligence shown by many speakers on the most important phases of the subject. The spirit of the debate and conclusions now arrived at bear evidence of the thorough manner in which the farmers have put their experience and knowledge of cattle-breeding to the most profitable account.

It will be interesting to readers to know the minds of the farmers on this absorbing question, and those that have hitherto differed in their ideas as to breeding will have good reason to reconsider their views. The farmer has wisely evaded giving unanimous approval to one particular breed as best adapted for South Australia, and although reports have been circulated in support of different breeds and classes of stock, they have missed their object and given more strength to the determination of the farmer to uphold what has proved more adapted to his own district and purpose and returned the greatest monetary gain. The Shorthorn grade has won the premier position, a position held for a number of years back in our good dairying centres. The pure Shorthorn has been favoured in the finest districts of the State and where cheesemaking is extensively carried on, yield of milk being the first consideration. The Shorthorn-Jersey has achieved a victory over all other crossbred stock, and when the views of the farmer are listened to there is certainly much to commend its suitability for dairying purposes. In the more exposed areas and hilly parts in South Australia the Ayrshire claims keen admiration, and rightly so, for she is peculiarly adapted to withstand conditions more destructive to other breeds found here

The object of the farmer has been to breed up to a pure strain, but he contends that the difficulty and cost of procuring high-class sires and dams have proved to be the main difficulty in the improvement of his cows. All agree that grading the herd and raising the best from the best for dual purposes, and not crossing at random, is a step in the right direction. Illustrations of this are to be seen where splendid herds are now depasturing on many farms formerly stocked with a poor, unprofitable, and nondescript class of cattle. Here is an example of what has been accomplished by an eminent breeder of milk cows in England, and which bears out what the dairy farmer has been aiming at in South Australia. Writing to an agricultural journal on the subject he says as follows:—"Some years ago at Bearwood we had a cow, a cross between the Jersey and Shorthorn, but following most the Jersey breed. She was first prize in her class at the London Dairy Show, and took also a milking prize in addition to various prizes at other shows. I mated her with a very heavy-fleshed Shorthorn bull, from extraordinary milking strain, and she produced in course of time three cow calves in succession, all of which took prizes at the London, Bath and West, and other shows. Although of grand shape and form, they proved remarkably heavy milkers and of excellent quality, thus showing that, although they all three took their sire's immense frame, they still retained the dam's milking powers, of which, I believe, the sire played his part." The writer concludes:—"To please a lady's or gentleman's eye and grace the park is one thing, but to pay rent and earn a living out of them is altogether another and more difficult matter."

At meetings attended by the writer the thoughtful mind of the farmer had wandered over a big field looking well into the future, and issuing a note of warning not to push the heavy stock too much, as our climate and feed are so peculiarly adapted to rapid fattening at a period when the milk flow is most in danger. He tells us not to develop flesh at the sacrifice of milk and butter fat, but should this happen the Jersey bull would be welcomed to regain the decaying propensities of the dairy herd. These remarks would apply more to the Aberdeen-Angus and Hereford breeds. A question and a sore point with some speakers rarely escaped debate at the farmers' meeting, and that was whether a difference existed in the milking and fattening Shorthorn. Opinions proved to be contrary between the dairyman and the "bigger" farmer, the former believing in the existence of two strains, while the latter claimed to know better, that such was not the case, Shorthorns being equally prized for their all-round excellence as milk and beef producers. That the dairy farmer is right is beyond dispute, but the distinction does not claim the same importance now as it did thirty years ago. We must not, however, allow ourselves to be prejudiced against the Shorthorn on that account, for attention to selection in breeding would soon overcome any existing danger. To show that a distinction in type is beyond contradiction, we find it most convincing to quote reliable authorities, and for this purpose I give what appears in an issue of *The Scottish Farmer.* The subject was given particular prominence in the paper, and is headed "Shorthorn Types."

Describing the Bates Shorthorns, or milking strain, the article reads:—"For animals of that class thousands of pounds were being paid, and there was keen rivalry, not to say enmity, between their patrons and the patrons of the more fleshy, thicker, shorter-legged, but decidedly less stylish and more patchy Booth cattle. For well-nigh ten years now, however, there has been little fight in it, as the history of Shorthorns, alike in the showyard and the sale-ring, during that period is very much a record after record for Cruickshank (a beefy strain, bred by Cruickshank, Scotland). An important question is thereby suggested. Can the thick, short-legged, or what an American writer calls the 'pony' type of cattle unaided maintain its supremacy? Must there not be a reversal to some extent to cattle of greater style, although less fleshy? And is the 'pony' type by itself consistent with dairying properties, or even good milking powers?"

Truth usually lies in the middle, and while we cannot agree that every Scottish Shorthorn cow is deficient in milking properties, it is true that in respect of the shapes usually identified with lacteal fruitfulness the order in the Shorthorn world is: Cruickshank, good; Booth, better, Bates, best. Several attempts have been made to amalgamate the Cruickshank and Bates types, and alike at the bull sales and at the fat stock shows enough has been said to warrant the belief that, although violent, the cross has not been disappointing.

In another paper, *The North British Agriculturist* of November 4, the following extract, reprinted from *The Times*, is given under the heading of "Shorthorns in Argentina":—"The Argentine breeders have not resorted to any special strain of Shorthorns, but the tremendous impetus lately given to the dairy industry makes the milk strains, such as those of the Bates families, popular. At present the Cruickshank Shorthorns predominate largely The Shorthorn bulls sought by the Argentine breeders must be short in the legs, deep and long in the body, with a good head - special stress is laid on the head—full, wide chest, well-laid shoulders, strong loins, and well-sprung ribs, covered with deep, mellow flesh, also full hindquarters. The colours mostly in favour are deep red and roan, the former preferably. Shorthorn cows, especially those known to be good milkers, and heifers of approved milking and beef antecedents, are very much in request. Last year all pedigree cows, even inferior and old ones, were sold at very good prices. There is a buyer, it is asserted, for every Shorthorn cow, not necessarily a choice specimen, but of good type and antecedents. To secure top prices, however, cows must be strong in the hindquarters, and possess unmistakable beef qualities."

Crossing of milking stock has been very intelligently debated by the dairy farmers, and expressions of regret have been heard and apologies made for transgressing by the use of inferior bulls in their herds, in place of employing animals of pure breed from heavy milking strains. Unanimous opinions favour the first cross, and correctly so, for the farmers' experience has demonstrated that the same reliance cannot be placed on the progeny following.

In the discussion on breeds of the more beefy type the Aberdeen-Angus for dairying purposes was without a supporter, the meat-producing properties of the breed being insufficient to compensate for loss of milk on the dairy farm. The black skin is not a dual-purpose cow in the general sense of the word, and a suggestion made at one of the meetings to use crosses of the Aberdeen-Angus failed to elicit support, the consensus of feeling being against the resultant progeny. The Doddies were also shown to be changeable of temper, incurring trouble and annoyance both in the paddocks and milking bails. The Aberdeen-Angus cattle are world famous for their rare quality of beef, and a cross with the Shorthorn has turned out remarkably successful in Scotland, where so much fat stock is reared annually for the English markets.

The Hereford breed was not overlooked at our meetings, and although one or two interested persons demonstrated that heavy milkers were common on some farms, it was generally accepted that the Hereford possessed more of the characteristics of fat cattle. There are payable milkers in every herd of cows, but a good return in milk and butter from an Aberdeen-Angus or a Hereford and the occurrence of an extraordinary yield of flesh in a crossbred Jersey are not calculated to make us select the Aberdeen-Angus as the best cow for milking purposes and the Jersey for beef production. Where skill in breeding is brought into force the farmer can through time change the inherited properties of his Herefords to meet his demands for milk and flesh combined. The explanation of this made it clear to the practical mind how changes are wrought in the Shorthorn strains, but a blending so to speak of the extreme dairy cow and the beefy animal was particularly favoured by a large section of dairy farmers.

It is claimed for the Hereford that he is hardier than the Shorthorn, being better adapted for poor parts of the country, but in better districts steers of the Hereford breed do not fatten so readily, and the Shorthorn produces a heavier, finer-grained animal.

The Jersey is not a dual-purpose animal, and that is one great drawback to her popularity amongst milk suppliers In good country, where the raising of beef in conjunction with milk gives the highest profit the Jersey is out of it. But, on the other hand, where the farmer has tried and failed in the breeding of heavy stock, climatic conditions and market being in favour of the extreme dairy type, the high-grade Jersey would be found more suitable. We are not going to dispense with the Jersey. It would have bad results if we did, and those having a knowledge of butter production can readily value her special purposes for the dairy. The cows are right in their right place, and it is the duty of the farmer to keep them there.

CONCLUSIONS ARRIVED AT.

1. That the purebred Shorthorn sire improves the dairying propensities of a herd more than any other breed . that the value of his progeny out of inferior cows is higher for yield of milk, weight and quality of flesh.

2. The large dairy type of cow is preferred to the extreme dairy type, and the dual-purpose cow is more adapted for town dairying and in good districts where cheesemaking is carried on and the meat market good

3. Crossbred bulls have been condemned as having lowered the standard of our milking stock, and the difficulty and expense in obtaining good sires has been a great obstacle to improvement in our herds.

4. Grading or selection will pay the farmer handsomely, but to rear calves from the unprofitable cows and where breed cannot be described and the bull unworthy of a place on the farm, is money thrown away.

5. Aim at a strain of cows to suit conditions of district, demand for milk or cream, and market for beef.

6. Do not put much faith in crosses after the first or second calf, unless the herd is a high-class one.

7. The Jersey cow is an extreme dairy type, and is valuable for adding milking vigour to herds deficient in this respect.

NOTES FOR FACTORY MANAGERS.

DEFECTS IN CHEESEMAKING.

By G. S. THOMSON, F.R.S.E., GOVERNMENT DAIRY INSTRUCTOR.

Having been engaged in the making of cheese at different factories during the past two months, I have made enquiries into existing defects in flavour and texture of the product.

Reports received complain of a toughness in the cheese when a few weeks old, and a want of flavour in the ripe article. Samples received from factories illustrate that excess of acid has been developed, and the characteristics of the cheese show the need for more cooking in the vat. Visits to factories verified this conclusion, and the injury and loss occasioned to cheese have been found to arise principally from the want of necessary plant and assistance to the cheesemaker. In many instances managers are found grappling with difficulties of this kind, which are of a very serious nature, making it almost impossible for the most experienced and trusted hand to produce a first-rate cheese. In the manufacture of cheese the attendance of the manager is urgently required from first to last, and nothing should be allowed to distract his attention from the vat. This is not the case with the majority of factories, as managers are expected to superintend and take part in every operation, instead of leaving less important work in the hands of an assistant during the cheesemaking season. At critical moments in the manufacture of cheese the maker is called away, leaving the valuable curd to the mercy of a fast-increasing acid. What is the result? The quality of the cheese suffers permanent injury—his five or ten minutes' absence has been the cause of his missing to exercise at the right moment a change in working necessary to the production of a choice flavour in the cheese. In this way hundreds of pounds are lost to the factory, which it might have been saved at the cost of an inexpensive addition to plant and more help to the manager.

I would recommend to cheesemakers to be better prepared to deal with curd when the proper degree of acidity has developed. and unless fast milk is under treatment do not check the acid throughout the working process. Running off the whey as rapidly as possible and scooping out the well-drained curd into the cooler are factors of the highest importance to cheesemaking. Dependence upon a small siphon to drain the whey from a vat is a most objectionable feature, and is undoubtedly responsible for serious injury to the curd. Attention to this is urgently wanted. I would further point out that stirring the curd in the vat for a longer period is necessary, fifty minutes to one hour being absolutely required to produce the best effect on the texture of the curd and good quality of the cheese. A watchful eye on the development of acid in the vat as the curd lies at rest, and frequent tests made with the hot iron, guide the cheesemaker when to set his siphon at work. In factories in England and the Continent great stress is given to this operation, and not a second is lost to effect a hasty removal of the whey. Two lads are required to scoop the curd into the cooler instead of one, while the manager attends to the more important duty of stirring and piling the curd. Speed is also wanted here, and the sooner the matting is over the better for an even distribution of acid. With a curd that has been well looked after no rubbing is wanted, stirring being wisely preferred to save loss of fat and crushing of the curd, which follows the former practice. After careful piling, with the necessary amount of acidity, put the curd through the mill as fast as the machine will take it. Like the running off of the whey, time must not be lost here, otherwise the green cheese will be made up of quantities of curd varying in degree of acid, having an effect on the evenness of ripening and colour of the cheese.

COUNCIL OF AGRICULTURE.

The monthly meeting of the Council of Agriculture was held on Wednesday, December 9, 1903, there being present Messrs. J. Miller, A. Molineux, F. Krichauff, Col. Rowell, C.B., G. R. Laffer, T. E. Yelland, B. Basedow, R. Marshall, J. W. Sandford, and H. V. Pridmore.

The Minister of Agriculture advised that at the request of the Council he had instructed the Principal of the College to undertake experiments on a moderate scale in the cultivation of saltbush. Some discussion on the different varieties of saltbush took place. Mr. Molineux also referred to the great value as a standby during drought of the sheaoak. He regretted this tree was not appreciated and protected as it should be.

The Secretary read results of the sessional examinations at Roseworthy during the past year, and considerable discussion took place. It was resolved that the Hon. Minister be asked to obtain from Professor Towar a report on the results of these examinations, which the Council consider very unsatisfactory.

The Minister intimated that the question of providing additional sleeping accommodation at Roseworthy for the students would receive consideration when the necessity for the same was more clearly shown.

Some discussion took place on the question of rust-resisting wheats, and it was resolved to ask Mr. R. Marshall to supply a list of such wheats indicating the varieties suitable to different districts. Professor Towar to be asked for report on varieties grown at the College Farm.

Mr. Laffer referred to the question of the sale of codlin moth infested fruit. He thought the Government should indicate what course they intended to take this season. Last year, although the Department kept the Inspectors visiting the orchards, people were allowed to sell infested fruit without restriction, the consequence being that the money spent on inspection was simply thrown away. It was only fair to all that growers should know their position, and he moved —"That in the opinion of this Council the Government should indicate at an early date whether they proposed to permit of the unrestricted sale of codlin moth fruit" This was carried unanimously.

Some discussion took place on the question of the standard sample of wheat for the season, and, in reply to a question, the Secretary stated that the Chamber of Commerce did not communicate with the Council in respect to this matter Mr Yelland said he would like to see a fixed standard adopted for all the exporting States.

The following gentlemen were approved as members of the undermentioned Branches Port Broughton, Mr. W. Excell, Hawker, Mr. W. Lindsay; Orroroo, Mr H. Robertson, Yorketown, Messrs. J. Anderson, jun., and R T. Sabine, Naracoorte, Mr. M. J. Malone, Renmark, Messrs L Despard and G. B. Ogilvie

ROSEWORTHY AGRICULTURAL COLLEGE NOTES.

FARM.

By J. D Towar, Principal Agricultural College

Harvest Results.

The harvest, with the exception of a few acres to be reaped, was finished on Tuesday, December 22, when the students departed for their homes, to remain until January 4. It is too early yet to give full reports and definite statements of the yields of the crops and the results of the experiments, but enough is known to assure us that better yields were realised than was anticipated. The Gluyas wheat is giving the highest yield in grain, followed by Fan, College Selection, and King's Early, in the order named. In the test for yield of hay Dart's Imperial heads the list, followed in order by Leak's Rustproof, College Selection, Majestic, King's Early, and Defiance

The hay is secured in two large stacks at "The Island," one at Flett's, and one in No. 8, near the barn. According to measurement, there is nearly 500 tons in the four stacks. As the hay from the large fields was not weighed an accurate figure of the yields cannot be given, yet conservative estimates of the return from "The Island" and Flett's, based on the measurement weight of the stacks, fix the yield at fully 2 tons per acre, while the yields of hay from fields Nos. 6 and 8 will fall short of 1¼ tons per acre.

In the experiment in "The Island" field, where College Selection wheat, drilled and cross-drilled, was compared with College Selection cross-drilled with Defiance, the results, for a small measured area, gave 5,289 lb. of hay per acre for the College Selection alone, and 5 171 lb. per acre for the College Selection and Defiance mixture These figures may be taken as a fair average for the yield of that portion of "The Island" where the College Selection was sown.

Threshing Operations.

All of the barley, about 15 acres of oats, and 80 acres of wheat were cut with binders and threshed. The remainder of the grain was secured with strippers and harvesters. While stripping the grain proves a very efficient and rapid way of securing the grain, the results from binding and threshing have this year been the more satisfactory. We began cutting and stooking the crop as soon as the grain was past the dough state, and continued until the whole crop was cut. In fact, about 40 acres that had been left for the stripper were later on cut and threshed.

One particular advantage of this method of harvesting lies in the fact that every kernel of the grain and all of the straw is saved. We haul the crop direct from the stook to the thresher. Here the grain is threshed and secured in three grades, and the straw is separated from the chaff. Since the College has owned the oil engine and straw press the straw has gone direct from the thresher to the press. This year we have thus secured about 90 tons of bright, clean straw, which has already found market at a price nearly equal to that paid for hay in this locality. Throughout the threshing season we worked from 5 a.m. until 8 p.m., and our highest record for a single day was 177 bags of barley. A hundred bags of wheat per day is considered a good long day's record. We find that about 42 per cent. of the unthreshed crop comes out in the straw.

Nearly 1,400 bags have been filled with grain—all grades included. The highest field average was 40 acres of College Selection in Flett's, which yielded a little over 24 bushels per acre. From 36.25 acres of barley in Dahlitz field we secured 1,766.54 bushels of grain, 112.9 bushels of which was graded as seconds. The gross yield, however, averaged 48.73 bushels per acre.

THE SILO.

The College dairy herd is now receiving silage from the silo which was filled fourteen months ago. Last summer the feed came on before we had finished the last silo, and accordingly the silage was carefully re-covered and allowed to remain. The covering was removed this season and fresh silage put in to the depth of 6 or 7 ft. to fill the cavity. Both the new and the old silage have come out in splendid condition, neither being injured in the least. Since beginning to feed silage the cows have shown an increase in the flow of milk, and their coats show a very healthy, sleek appearance.

FODDER CROPS.

Lucerne.—A portion of the lucerne patch has ben irrigated, and is now showing a strong, healthy growth. The heavy summer rains have favoured this crop, and the unirrigated portion will furnish us one good summer cut.

Rape and Kale.—On May 19 equal areas of ground—about two acres—were sown to rape and kale respectively, and each made a favourable growth during the winter. The rape was sown broadcast with a Cahoon hand seeder, using 4 lb. of seed per acre. The kale was sown in 16-in. drills, with an ordinary grain drill having every alternate spout closed. The rape came on more rapidly at first, and the more forward plants sent up seed stalks early in September. On October 8 50 sheep were turned into each plot. Those put in the rape weighed 4,000 lb., and those in the kale 3,700 lb. At the end of five weeks the sheep were again weighed, the rape having produced a net gain of 261 lb. of mutton, and the kale 263 lb. At this time, however, the rape had so far advanced in the production of stems and seeds that it was impossible to feed the sheep there longer. The 50 sheep were returned to the kale, where they remained until December 24, when they were removed. Throughout the eleven weeks they maintained splendid condition, being in better form at the end of the period than at the beginning. The kale stalks have produced an enormous amount of leaves, but are now flowering. The stems are healthy and vigorous, although entirely stripped of their leaves, and there is every prospect that they will throw out more leaves and afford more feed in the course of a few weeks. It might be said that the rape figured somewhat at a disadvantage in this experiment, as a portion of it was in close proximity to a row of gum trees. Added to this is the fact that it was not pastured early enough. Had we turned in the sheep before flower stems were formed, there is reason to believe that a more prolonged growth might have been secured. Of the two methods of seeding, the drilling appeared to be the more satisfactory, as the plants grew more vigorously, less seed was used, and the sheep found footpaths between the rows without walking on the plants.

MONTHLY RAINFALL.

The following table shows the rainfall for the month of December, 1903:—

Adelaide	1·16	Manoora	1·05	Echunga	1·31
Hawker	2·74	Hoyleton	0·71	Macclesfield	1·42
Cradock	0·33	Balaklava	1·27	Meadows	1·35
Wilson	0·85	Port Wakefield	1·57	Strathalbyn	0·47
Gordon	2·48	Saddleworth	1·71	Callington	0·76
Quorn	0·99	Marrabel	1·15	Langhorne's Bridge	0·39
Port Augusta	1·29	Riverton	1·60	Milang	0·49
Port Germein	0·58	Tarlee	0·79	Wallaroo	1·22
Port Pirie	0·80	Stockport	0·82	Kadina	1·70
Crystal Brook	1·06	Hamley Bridge	2·96	Moonta	2·17
Port Broughton	1·19	Kapunda	1·19	Green's Plains	1·30
Bute	1 61	Freeling	2·17	Maitland	0·96
Hammond	1·16	Stockwell	2·09	Ardrossan	0·95
Bruce	0 60	Nuriootpa	1·68	Port Victoria	0·75
Wilmington	1·34	Angaston	1·21	Curramulka	0·99
Melrose	0·90	Tanunda	2·41	Minlaton	0·64
Booleroo Centre	1·73	Lyndoch	2·49	Stansbury	1·06
Wirrabara	1·19	Mallala	2·05	Warooka	0·45
Appila	1·88	Roseworthy	1·99	Yorketown	0 86
Laura	1·06	Gawler	3·01	Edithburg	0·91
Caltowie	0 97	Smithfield	1·08	Fowler's Bay	0·60
Jamestown	1·10	Two Wells	1·40	Streaky Bay	0·36
Gladstone	0·71	Virginia	1·67	Port Elliston	0·17
Georgetown	1·06	Salisbury	1·57	Port Lincoln	1·26
Narridy	1·38	Tea Tree Gully	2·00	Cowell ...	0 96
Redhill	1 79	Magill	2 01	Queenscliffe	2·43
Koolunga	1·07	Mitcham	1·04	Port Elliot	0·82
Carrieton	0·59	Crafers	2·13	Goolwa	0·47
Eurelia	0 90	Clarendon	2·50	Meningie	0·51
Johnsburg	0·68	Morphett Vale	0·71	Kingston	0·78
Orroroo	1·65	Noarlunga	0·70	Robe	0·89
Black Rock	1·16	Willunga	0.87	Beachport	0·80
Petersburg	0·59	Aldinga	0·96	Coonalpyn	2 54
Yongala	0·71	Normanville	1·27	Bordertown	0·54
Terowie	0 37	Yankalilla	1·14	Frances	0 78
Yarcowie	0·25	Eudunda	1·80	Naracoorte	0·74
Hallett	0·63	Truro	1·01	Lucindale	1·02
Mt. Bryan	0·60	Palmer	0·45	Penola	0·96
Burra	0·96	Mount Pleasant	0 95	Millicent	0·72
Snowtown	1·15	Blumberg	2·20	Mount Gambier	1·47
Brinkworth	0·84	Gumeracha	2·32	Wellington	0·47
Blyth	1·54	Lobethal	1·48	Murray Bridge	0 75
Clare	0·99	Woodside	1·07	Mannum	1·13
Mintaro Central	1·04	Hahndorf	1·87	Morgan	1·24
Watervale	2·16	Nairne	0·95	Overland Corner	0 95
Auburn	2·44	Mount Barker	1·42	Renmark	1·16

CORRESPONDENCE.

SPRAYING FOR CODLIN MOTH.

To the Editor.

Sir—In the report in *The Journal of Agriculture* of meeting of Longwood Branch on October 31 it was stated that Mr. E. J. Oinn tabled samples of Gravenstein apples about the size of ordinary marbles. Also, in the same report, that some of the delegates at the Cherry Gardens Conference thought Mr. Oinn had made a mistake when he stated in his paper that he sprayed this variety the second or third week in October, when the fruit was as large as marbles, with arsenate of soda. In common justice, it is only fair to the other delegates to the Conference to say I was the only member who expressed the opinion that he had made a mistake, and I am still of the same opinion. The date of the Conference was October 6. After arriving home I examined the Gravenstein apple trees in our locality, and found they were not in bloom, and they did not come into full blossom until a week later, i.e., the second week in October As far as my experience goes—and I think, without boasting, I am in a position to say- -there is very little difference in the hills, on the eastern slope of the Mount Lofty Ranges at all events, between the times when certain fruits blossom, mature, etc. Besides, Mr. Oinn's own statements do not quite agree. At the Conference he stated that when sprayed about the second or third week in October the fruit was about as big as marbles; at the meeting of the local Branch, which took place on October 31, the apples were only the size of ordinary marbles. Seeing that fruits of all kinds are more forward this season than last, if this variety of apples were the size stated early in October last year, they should have been somewhat larger at the same periods this year. I should also like to point out that the Gravenstein is not the earliest variety, there being several earlier than it. In reference to the question of the hatching of codlin moths I would like to state that experience has proved conclusively that what takes place under artificial conditions in connection with the codlin moth is a very poor guide as to what will take place under natural conditions. I am prepared to stand by the statement that spraying with any mixture for codlin moth in the hills on the eastern slope of Mount Lofty Ranges before the first or second week in November is a needless, useless waste of time and material.—Yours, etc.

George Monks.

Forest Range.

FARM AND DAIRY PRODUCE MARKETS REVIEW.

Messrs. A. W. Sandford & Company report on January 1, 1904.—

Agriculturists and pastoralists will with pleasure always look back on the year 1903, it having been to them one of the most favourable, for the long drought broke up at the beginning of the year, and each succeeding month almost excelled its predecessor in the splendid rainfall recorded. Even December, which is invariably dry, has had so much broken weather that harvesting has been delayed, and reports are to hand from several districts of some damage through rain, especially to the Hay; but as the Wheat yield and other crops are heavy, taking it all round, farmers this season have little to complain of. Meanwhile, pastoralists report plenty of feed and water, their only regret being that during such a bountiful time stock is not more numerous.

Amongst the mercantile community it was generally considered that a heavier volume of trade would have been put through for December, but they now report rather a dull month, and at no time did business approach the semblance of a spurt.

Metals.—In Silver and Lead there has been very little alteration in quotations since our last, whilst Copper has fluctuated somewhat, but is now reported firm. Tin shows an advance of close up to £10, with market still hardening.

Breadstuffs.—The European markets during the month declined, and sales of cargoes of Wheat made to U.K. were as low as 29s. At the present time, however, prices have again advanced, and the last cargo is reported as being sold at 30s. 1½d. per 480 lb. As is usual during December the Chamber of Commerce fixed a standard sample of wheat for the season, but the quality of those forwarded was very disappointing, red rust and heavy rains during harvest having done more damage than was anticipated. The standard was fixed at 61½ lb., the lowest on record. In consequence of the broken weather there has been no rush of wheat on the market, and shippers have had as much as they could do to fill their December engagements. On account of the lower rates in the European market values here declined till 2s. 10d. at any of the shipping ports was as much as could be obtained. Now, however, values are firmer. In Millers' Offal, Pollard has met with ready sale, but there has been no great demand for Bran. As prices in all the States are ruled by European values, the same conditions prevailed in Victoria and New South Wales. In forage lines, chaffcutters mostly predict trouble in the future, as many of the districts report damage to hay crops from the rains, but as the feed throughout Australia is plentiful, there has been no interstate export trade. Shipping quotations for Chaff, therefore, are only nominal. Local business in this line is also quiet, and in Feeding Grains the market is quite stagnant, with almost record low rates for Oats being quoted. Malting Barley.—This is raised in the later districts, and maltsters have scarcely yet started buying for the season.

Richman's Creek, November 2.

Present—Messrs. Freebairn (chair), F. H. and J. H. Lehmann, J. and J. S. McSkimming, Knox, Searle, Roberts, Knauerhase, Mattner, Nicholson, H. and J. M. Kelly (Hon. Sec.).

Weeds.—Members favoured the iceplant being declared a noxious weed. Poppies were reported by several members to be becoming bad in the wheatfields. A weed with a purple flower was also spreading.

Mannum, November 18.

Present—Messrs. Preiss (chair), Haby, Scott, Schulze, and Schuetze

Conference.—It was resolved to hold the Annual Conference of River Murray Branches at Mannum on February 24 and 25. All the surrounding Branches of the Bureau are requested to assist in making the Conference a success.

Watervale, November 30.

Present—Messrs. C. A. Sobels (chair), E. E. Sobels, Croft, Ashton, Scovell, Holder, Treloar, Perrin, Solly, Hunter, E. W. and O. H. Castine (Hon. Sec.).

Branch Show.—It was decided to hold the annual show of products of the district early in autumn, 1904.

Bureau Management.—Mr. E. E. Sobels read a paper on this subject, in which he strongly urged members individually to take a personal interest in the work of the Branch, and so increase its value to the district. He favoured increasing the limit of membership to twenty, instead of fifteen, where the population of the district warranted it Sometimes it is asked, "What good does the Bureau do?" The answer to this question must depend in every instance upon the members of each Branch. There could be no question that the Bureau had been largely responsible for the many advancements in agricultural practices that had been made in South Australia of late years

Eudunda, November 30.

Present—Messrs. Weil (chair), Seiber, Walter, Kluske, Krummel, J. A., E. J., and J. Pfitzner, and Marshall (Hon. Sec.).

Business.—Each of the members tabled samples of wheat, barley, etc., some splendid specimens being shown Members found rust generally most pronounced on rich, heavy crops of wheat, especially where stable manure had been applied Marshall's No. 3 wheat was found to resist or escape damage by rust.

Koolunga, December 3.

Present—Messrs. Butcher (chair), Shipway, Sandow, Lawry, Button, Jose, Atkinson, Cooper, Burgess, Butterfield, and Noack (Hon. Sec.).

Noxious Weeds.—The Noxious Weeds Acts were discussed at length, and various defects pointed out. Members stated that under the present law it was not difficult for any person to convince the presiding Magistrate that he was doing his best to destroy the proclaimed weeds, and so escape punishment. They thought the Act should be so amended that those who failed to take reasonable steps to carry out the law should be punished. Several members blamed the larger landholders for not doing their duty in respect to noxious weeds. Mr. Button tabled plant growing quite close to the ground, with long, silvery, green leaves, which were covered with prickles. This weed was quite unknown to members.—[The specimen tabled is *Cirsium acaule*, or the stemless horse thistle. It is an introduced weed: has been proclaimed under the Noxious Weeds Act, in some parts occupies considerable areas of land, and where particularly luxuriant practically covers the soil.—Ed.]

Renmark, December 3.

Present—Messrs. Showell (chair), Kelly, Cole, Millar, Huggins, Geneste, and Evans (Hon. Sec.), and one visitor.

Fruit Pest.—The Hon. Secretary reported that a large green "hopper" was doing considerable damage to apricot fruit. He tabled specimens of the insect, and also of badly damaged green fruits.—[Mr. J. G. O. Tepper states that this is a species of *Taeniomena*, and is allied to the locusts. If these insects are numerous spraying with some arsenical compound would prove the most effective remedy, but in this case the fruit is too nearly mature to make it advisable to use any poisonous preparation of this character.—Ed.]

Fertilisers.—Considerable discussion took place on the question of fertilisers for orchard work.

Wilmington, December 2.

Present—Messrs. Slee (chair), Maslin, Schuppan, Zimmerman, Lauterbach, Broadbent, Bauer, Noll, Robertson, and Payne (Hon. Sec.), and a large number of visitors.

Dairying.—Mr. G. S. Thomson, the Dairy Instructor, gave an interesting address on dairy breeds of cattle, their managment, etc. A large number of questions were asked, and a hearty vote of thanks accorded Mr. Thomson for his address.

Rhine Villa, December 4.

Present—Messrs. Payne (chair), Farey, H. Mickan, Schick, Lewis, Hecker, H. Mickan, jun., W. T. and J. W. Vigar (Hon. Sec.).

Manure Experiments.—Meeting was held at residence of Messrs. J. W. and W. T. Vigar, for purpose of inspecting experimental plots. Plot manured with 60 ℔. mineral super promised equally as well as where 100 ℔. of super had been used. Both had suffered slightly from hot winds, but the wheat on the unmanured land being later in coming into ear had escaped injury. Phosphate powder appeared to be as good as the super, but the Reliance phosphate crop was not so promising Where Thomas phosphate and ordinary quicklime had been applied the crop was a little behind even the unmanured land, but the heads were filling splendidly. A number of plots of unmanured wheats were inspected. These were selections made from a small plot of Manitoba wheat. Most of them were too late for this district, but one was very promising, being earlier than Purple Straw, and carrying a nice club head.

Finniss, December 7.

Present—Messrs. S. Collett (chair), T. Collett, Chibnall, and Henley (Hon. Sec.).

Rust-resisting Wheats.—Considerable discussion took place on this subject. Members consider it advisable to always sow a portion of the crop with rust-resisting wheats.

Mount Compass, December 12.

Present—Messrs. Jacobs (chair), Arthur, Gowling, Good, Klauss, Decaux, Slater, Sweetman, F. and H. McKinley (Hon. Sec.).

Botfly.—Members report the horse botfly was very troublesome this season in the district.

Potato and Onion Production.—A long discussion on this subject took place.

Lyndoch, December 3.

Present—Messrs. Kennedy (chair), A. and H. Springbett, Ross, Schenke, and Mitchell (Hon. Sec.), and three visitors.

Fruitgrowers' Association.—It was decided to call a public meeting to consider the advisableness of forming a branch of the South Australian Fruitgrowers' Association at Lyndoch.

Branch Show.—A committee was appointed to arrange for annual show of products of the district.

Purchase of Manures.—Members wish to know whether the Branch has power to purchase fertilisers for farmers.—[The members of several Branches of the Bureau arrange to purchase their requirements of manure in one line in order to secure a reduction in cost, generally given on large orders, and there can be no objection to this practice. Those ordering the manures are, of course, responsible to the firms from whom they purchase.—Ed.]

Mount Pleasant, December 11.

Present—Messrs. P. Miller (chair), J. and E. G. Miller, Godfree, Maxwell, Lyddon, and Vigar (Hon. Sec.), and two visitors.

Homestead Meeting.—This meeting was held at the residence of Mr. G. A. Vigar, partly for the purpose of inspecting a complete harvester at work in the wheat crop. Owing, however, to the rain on the previous night the straw was too tough to permit of satisfactory work. Red rust was noticed in the wheat. Zealand variety was very rusty, though the grain appeared to be filling. It was going down badly, and breaking at the joints. White Tuscan had but little rust on it, and was doing well. Brown Tuscan was very rusty, but the grain appeared to be filling all right. A number of young apple trees were doing well, though suffering from attacks of caterpillars. Mangolds grown between the trees were also badly attacked in places. It was noticed that the portion of the orchard nearest the fowlyard had not suffered much from the caterpillars, the fowls having kept them down.

Millicent, December 4.

Present—Messrs. McRostie (chair), Hart, Hutchesson, Varcoe, Campbell, Crouch, Oberlander, Holzgrefe, and Davidson (Hon. Sec.).

Weeds.—Mr. Holzgrefe stated that he had never experienced so much trouble with weeds as this season.

Co-operation.—A long discussion ensued on paper read at previous meeting by Mr. Campbell on "How Co-operation will Suit the Local Farmer." Members generally agreed that farmers would benefit from the adoption of a proper system of co-operation in selling their products.

Flax.—Mr. Campbell tabled sample of green flax, about 2 ft. 6 in. high, healthy, and strong. Mr. Oberlander stated that the sample was rather coarse for fibre, but this would be overcome by thicker planting. He thought labour here too dear to permit of flax being grown for fibre, but it should pay for linseed.

Port Elliot, December 19.

Present—Messrs. Welch (chair), Gosden, Pannell, W. E. and W. W. Hargreaves (Hon. Sec.).

Manure Experiments.—Mr. W. W. Hargreaves reported on experiments with nitrate of soda as a top dressing for hay crops. On land manured with 100 lb. of bonedust per acre and sown with oats, 84 lb. of nitrate of soda was applied—first, in one dressing at end of July; second, in two dressings at end of July and August respectively; and third, in one dressing at end of August. The manure increased the yield on plot 1 from 15 cwt. per acre to 19¼ cwt.; on plot 2, to 15¾ cwt.; and on plot 3, to 17 cwt. of hay.

Onetree Hill, December 3.

Present.—Messrs. J. Bowman (chair), G. Bowman, Blackham, Hould, Hogarth, W. and E. A. Kelly, Smith, Thomas, and Clucas (Hon. Sec.).

Wheats at Adelaide Show.—Circular from Royal Agricultural Society on this subject was discussed. Members consider the conditions somewhat complicated, while the clause requiring the exhibitor to hold 50 bags for inspection would involve considerable risk of loss.

Weeds.—A member stated that a weed with a blue flower, and growing to a height of about 18 in., had appeared on his land, and he thought the seeds came in the wool of a mob of sheep he had purchased. The plant appeared quite harmless. [If a specimen in flower is sent to the Department of Agriculture the question of the harmlessness or otherwise of the weed could easily be determined.—Ed.] The stemless horse thistle had been very plentiful in the neighbourhood. Generally it was considered a safe practice to cut up and destroy all suspicious growths that appear on the farm.

Farming.—Mr. Kelly was questioned on matters pertaining to farm operations. For hay he found Majestic a good variety. It should be cut on the green side, as it lost weight in maturing. He found King's Early quickly deteriorated, but other varieties might suffer equally if seed was not changed frequently. Majestic was rust-resisting, and stood up well, but merely as a rust-resisting wheat he had nothing to better than Marshall's No. 3. He had a mixed crop of this and White Tuscan, and, while the latter showed rust very plentifully, the former was quite clean. Mr. Hogarth stated that he had grown Majestic for four successive years without securing new seed, and the last crop was the best. The new hybrid wheats were almost certain to deteriorate without continuous selection. Mr. Kelly did not think it would pay to apply more than 100 lb. per acre of phosphates in this district. Wet soil required more manure than dry soil. He thought that a mixture of mineral super and bonedust would be a good manure, as the bonedust would give lasting power to the manure. He had mixed Adelaide Chemical Works wheat manure and mineral super at the rate of two parts of the former to one of super, and harvested a thirty-bushel crop from the land treated. Under favourable conditions he considered drilling seed and manure together would give the best crop, but as favourable conditions at seeding time were a great factor in the success of the crop it might be more profitable where large areas were dealt with to drill in the manure first and broadcast the seed when the ground was in good condition. If the land was moist enough he liked to sow in May, provided the weeds were well started, but it was better to wait till June than to have the young wheat plant smothered. The nature of the soil must regulate the depth to fallow. Fallowing should be done as early as possible. Clayey soil should get as much cultivation as possible, but not so with limestone country. The fallows should be worked after every rain, but he would not go deeper than 2½ in. He strongly advocated pickling the seed as a safeguard against smut.

Gladstone, December 5.

Present.—Messrs. Brayley (chair), Bond, Tunbridge, McDonald, and Wornum (Hon. Sec.).

Soil Fertility.—Under the auspices of this Branch Professor Towar visited the district on November 6 and gave a very interesting address on "Soil Fertility," a good number of visitors in addition to members of the Branch being present.

Conference.—Arrangements for holding forthcoming Conference of the Northern Branches of the Bureau at Gladstone early in 1904 were left to the officers.

a Greater
recognised
South Australia
was to be carried on upon paying lines, and that any man who expects to make much money out of wheatgrowing alone will come to grief, unless he has been born under a particularly lucky star. Although the necessity for mixed farming is partially recognised, taking the farmers generally, beyond keeping a few cows, sheep, and poultry, depend almost entirely—probably to too great an

extent—upon wheatgrowing. If possible it would certainly be wiser to grow a variety of crops, so that if any one fails there would still be others to depend upon for some return. As a comparative newcomer to the district he would be glad to know what other crops had been grown, under what conditions, and with what results? He thought it had been demonstrated that oats will succeed well here even in dry seasons. Last year was the driest they had exexperienced, yet on fallowed land they obtained a return of six bags per acre of Algerian oats; and this year, on stubble land, they secured two tons per acre of oaten hay. He had noticed a number of farmers this year were growing oats rather extensively. That their horses will do much better upon a mixed diet there could be no question, and a change occasionally from wheaten to oaten hay or chaff will prove beneficial. As wheat seems to do well after oats, and *vice versa*, it is probable that stubble land can still be profitably cropped; at least, his short experience led him to that conclusion. Barley also might receive more attention. The grain is excellent for pigs, and the straw has better feeding value than either oaten or wheat straw. Its heavy yield makes it well worth growing. From land which last year gave 17 bushels of wheat per acre they reaped this year over 11 bags of Cape barley per acre. This has, of course, been a very favourable season, but he heard of yields up to 7 bags last season. He considered the district well adapted to the production of barley on a large scale, and there was no reason why the district should not produce enough pigs to warrant the erection of a bacon-curing factory. Field peas would, he thought, do well. They make the best of feed for pigs, and improve the ground for cereal crops. This year he had eight acres under peas, and had every promise of a good return, but the dry spell in October and a raid by caterpillars brought about almost a complete failure. He hoped next season, by planting earlier, to have better results. He had grown a quarter of an acre of swede turnips, and thought they would do well in this district, but it was questionable whether they could be turned to any great profit. Although he had not tried them, yet he thought rape, canary seed, and linseed would probably pay to grow in suitable localities Some discussion ensued. Mr. Brayleigh had not been successful in growing oats He had grown good mangolds on comparatively dry soil. Mr. Bond had harvested 40 bushels of oats per acre this season.

Morchard, December 5.

Present Messrs. Scriven (chair), McDougall, Kupke, Graham, O'Loughlin, Toop, Kitto, Forbes, and Beck (Hon Secretary).

Short-weight Binder Twine. Members express great dissatisfaction at the weights of balls of binder twine, and state that it is very unusual for them to get full-weight bales, and in some cases individual balls are 10 oz. to 12 oz. short. As the twine is charged for according to the reputed weight of the bales, members consider that farmers should insist on the twine being weighed on delivery and paid for according to actual weight.

Exhibits Samples of wheat were tabled by each member and considerable discussion took place on the relative values of the different varieties, nearly every kind having both good and bad qualities, and no decision could be arrived at as to which were best suited to the district.

Red Rust. -Members state that this locality is not liable to attacks of red rust, possibly owing to the height above sea level and to the dryness of the district.

Mount Bryan East, December 5.

Present— Messrs. Bryce (chair), Thomas, Dunstan, Honan, T. and E. B. Wilks (Hon. Sec.), and two visitors.

Red Rust.—A lengthy discussion on this subject took place. This district is generally comparatively free from rust attacks, but the crops in some parts this year have suffered considerably.

Lucerne. —Mr. Thomas tabled samples of lucerne grown on land sown on February 16. Where the crop had not been cut previously the lucerne was 4 ft. 6 in. in height. The sheaf from the second crop was 3 ft. 6 in. long, and much superior to the other for feeding. The lucerne had not been irrigated at all.

Clare, December 4.

Present—Messrs. Birks (chair), Christison, Kelly, Knappstein, Carter, and McCarthy.

Lucerne. Mr. C. J. McCarthy read a paper on the cultivation of lucerne. He said it was well known to be one of the best of fodders for all kinds of stock, and he failed to understand why the farmers of this district had not gone in more largely for its cultivation, one of its greatest values lying in the fact that it is at its very best when all other grasses are dried off. Early in October of last year he broke up a new piece of land that had been grubbed during the previous winter. Previous to sowing he ploughed about nine inches deep and worked the land very fine by means of alternate rolling and harrowing, as it was very necessary to have the seedbed both solid and fine. By January the crop had grown to from a foot to eighteen inches in height. They then put the stock in and fed down quite bare, but by the latter end of October of this year the crop was quite as high, if not even higher, than it was before. He sowed from 15 to 20 lb. of seed per acre, but would advise any one sowing broadcast to use 20 lb. To ensure success there must be sufficient moisture in the ground to germinate the seed at once, and should rain not fall within a week or so, it may be necessary to resow. Lucerne does well on black, loamy, free soil, and grows much more vigorously on this class of soil than on the lighter and sandy land, and, like all other plants, the better the soil the better the crop. It is a mistake to let it seed, since it takes too much out of the plant, which turns a yellowish colour. As soon as it starts to come into flower feed it down. It is a good idea to sow behind a roller of, say, 10 ft. or 12 ft. wide, choosing a calm day, which will conduce to an even sowing, and it is advisable during the first year to keep it free from stinkwort and other weeds by means of the hoe. Late in August this year he put in another plot of five acres, and it is now six inches in height. Mr. Birks advocated drilling the seed instead of broadcasting, and giving a dressing of 2 cwt. of manure per acre; 5 lb. seed per acre was sufficient if the seed is drilled in. Mr. Christison considered it better to cut the lucerne the first year instead of feeding it off. After it is once thoroughly established great benefits result from breaking the surface with the cultivator or other implement

Ardrossan, December 5.

Present—Messrs. Freeman (chair), Dinham, Henderson, Cane, Cornish, Morgan, Barton, and Opie (Hon. Sec.).

Chemical Manures. At previous meeting Mr. Opie read an interesting paper on soils, dealing with the composition of soils and the constituents taken up by plants. This paper was well discussed from the question of the results of manuring with phosphates. Members generally thought that with the practice of resting the land every third year and fallowing, the land in this district would maintain its fertility under the continued use of phosphate. Members also thought it would be well to carry out tests with other classes of manures, in order to ascertain those best suited to the soils of the district, as it was probable that the continued use of superphosphate might not be altogether satisfactory.

Cherry Gardens, December 8.

Present—Messrs. Burpee (chair), Jacobs, J. and C. Lewis, Wright, Metcalf, Partridge, Stone, Matthews, Potter, and Ricks (Hon. Sec.).

Annual Report.—The Hon. Secretary's eleventh annual report showed twelve meetings held, with an average attendance of 8.25, a falling off on previous year's record. No papers had been read by members during the year, and he strongly appealed to them to make an improvement in this direction. The usual Show in March and the Hills Conference in October were fairly successful. A vote of thanks was accorded to the retiring officers, and Messrs. T. Partridge, E. Matthews, and C. Ricks were elected Chairman, Vice-Chairman, and Hon. Secretary respectively for ensuing year.

Murray Bridge, December 4.

Present—Messrs. Jaensch (chair), Edwards, Kutzer, Hermann and Heinrich Schubert, Wundersitz, and Lehmann (Hon. Sec.).

Wheat Prizes at Adelaide Show.—Some discussion took place on this subject, but no decision was arrived at, as the members have not as yet reaped any of good enough quality to warrant entering..

Takeall.—The Hon. Secretary read a paper on this subject. Takeall, or "dieback," appears to be increasing to rather an alarming extent in the district. Many years ago the farmers around Bugle Ranges, Mount Barker, and Balhannah had a similar experience when wheat was grown on a large scale. Many meetings were held to discuss the matter, but no definite conclusion was arrived at. Lately, however, it had been announced that the trouble was due to a special fungus. In this district wheat is affected in various stages; sometimes the plants die off before they have made any real stem; other plants die at different stages of growth up to the time the grain is filling, and often after a hot, dry wind they will notice some heads here and there going off, the colour of hay, with partly filled grain in the ear. They will often find patches several acres in area with only a few heads here and there coming to maturity, the rest having succumbed to the disease. His opinion, founded on close observation, was that the main causes were an impoverished soil, lack of moisture, bad cultivation, and loose seedbed. Without one or other of these conditions the disease would, he thought, not make much headway.

INDUSTRY.

SUPPLIED BY THE DEPARTMENT OF INDUSTRY.

Labor Bureau.

Number of persons registered and found employment by Government Departments and Private Employers from November 25 to December 24, 1903.

Trade or Calling.	Number Registered.		Number Employed.
	Town.	Country.	
Laborers and youths	30	50	143
Carpenters	—	—	5
Masons and bricklayers	—	—	2
Plasterers	—	—	1
Painters	1	—	4
Plumbers and ironworkers	—	1	—
Boilermakers and assistants	1	—	—
Blacksmiths and strikers	1	—	—
Fitters and turners	3	—	3
Moulders	—	—	2
Electrician	1	—	—
Compositors	1	—	—
Cook and sculleryman	1	—	1
Farm hands	—	—	2
Attendants	—	—	1
Apprentices	7	1	—
Cleaners	3	6	—
Porters and junior porters	5	7	—
Rivet boys	—	—	—
Totals	54	65	164

December 24, 1903 A. Richardson, Bureau Clerk.

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ICE PLANT.

By W. L. Summers, Inspector of Fertilisers.

While at Port Pirie last week for the purpose of obtaining samples of fertilisers being landed there I had the opportunity of inspecting some of the land in that locality infested by the weed known as "ice plant." Mr. S. Crispin, of Oaklands Farm, and a member of the Port Pirie Agricultural Bureau, drove me around and gave me some information concerning the weed. In dealing with this matter I would point out that there are two weeds known in the North as "ice plant." One is an indigenous plant—a species of Zygophyllum, I believe and the other an introduced garden plant, Mesembryanthemum crystallinum. The former is also known as "native spinach" in some parts, and is a decidedly valuable fodder; the latter is the weed that is causing so much trouble in the wheatfields and grazing lands in Pirie and Barootа districts. The application of the same name to two quite distinct plants has caused considerable confusion in the replies received to our circular enquiring whether, in the opinion of the members of the various Branches of the Bureau, the "ice plant" should be declared a noxious weed. Several Branches are emphatic in their opposition to any such action, characterising the plant as a valuable fodder, but I believe these in every case refer to the native plant. Other Branches, in districts so far free from the true "ice plant," are equally emphatic that the plant should be declared under the Act, and its destruction enforced, the reports of the damage it has done having caused considerable alarm. Most of those farmers *who have had some experience with the weed* are, however, so far as I could learn, opposed to the weed being declared noxious, and at present I must admit that the opposition is well founded, as it would in very many cases cost as much as the land is worth to eradicate it.

The following is a summary of the replies received from the Branches on this question: -Whyte-Yarcowie, Orroroo, and Koolunga oppose, as it is considered a good fodder, Wilmington, Wepowie, Bute, Appila-Yarrowie, Morchard, Wandearah, Davenport, Port Germein, and Crystal Brook answer "Yes," but, except in the last four districts, the members state the weed is not any trouble, and exists only in small patches; Wilson, Caltowie, Mount Bryan East, Amyton, Mount Remarkable, and Gladstone report that the "ice plant" is not known in their respective districts.

On entering Port Pirie by rail the "ice plant" (by which name the Mesembryanthemum crystallinum will be referred to) is noticed in the railway enclosures and on adjoining land for, I should estimate, a distance of about three miles. From the line the weed covers very large areas, extending in a southerly direction for several miles. I am also informed that northerly, towards the hills, in Port Germein district, and round about Port Augusta very considerable areas are infested. Mr. Crispin informed me that the weed was first introduced from Port Augusta by a gentleman living about two miles out of Pirie, and from his garden it has spread over the country. Mr. Crispin showed me a patch on his farm, amongst some mallee scrub, where it has been growing for about twelve years. This disposes of the opinion which appears to be held by some farmers that the weed will "wear itself out." Judging from what I saw during my trip, there must be many hundreds of acres of land in the immediate vicinity of Pirie badly infested by the weed.

The patches of weed vary in size from a few square yards to twenty or thirty acres or more. No one who has not seen it can form any adequate idea of the complete manner in which it takes possession of the land I walked across patches of several acres in area, where it had absolutely choked out everything but bushes and trees, and was shown a paddock that formerly carried good grass and other herbage, which is practically valueless from a grazing point of view, there being nothing but the "ice plant" which is now dead, and some plants of an annual variety of saltbush, which lasts but a very short time, and is apparently not relished by stock On the cultivated land the "ice plant" in many places completely smothered the wheat and even where the wheat got a good start before it was invaded the yield was reduced very materially

The one great difficulty in dealing with this plant is that it is almost indestructible If cut up it quickly makes root again even in the driest weather, in fact, I am informed on good authority that plants cut up and thrown over bushes or on the fence, so that they were not in contact with the ground at all, have continued to flower and produce seed for several weeks Some plants were sent to me by the Secretary of the Port Pirie Branch who stated he had pulled them up three weeks previously and left them on a dry, hard piece of land, where they continued to flower I kept these plants for fully a month in a small box in the office and at the conclusion of seven weeks from the time they were pulled up some of the stems were still quite sappy

Recognising that ordinary methods would fail in dealing destruction on November 5 1903, I wrote to the Secretary of the Port Pirie Branch, suggesting that an attempt should be made to kill the plant with a bluestone solution, following the methods successfully adopted in Europe for the destruction of charlock in cereal crops As the outer skin of the leaves is very tough rolling was suggested to break it after which the bluestone solution was to be applied Writing on December 7 Mr Crispin reported "As requested I tried the remedy suggested I bruised the plants with a garden fork and then sprinkled them with the bluestone solution After ten days the plants appeared dead but I found the roots still strong a week later the roots were dead also I also tried a patch of the weed with the solution without first bruising the plants, but it had no effect whatever" Mr Crispin's report is very encouraging as beyond the actual labour the cost will not be great The solution is made by dissolving 2 lb of bluestone in five gallons of water and with proper appliances 50 gallons per acre should suffice on the worst infested land This would mean 20 lb of bluestone at 3d or 5s per acre for bluestone The Port Pirie Branch has agreed to undertake experiments on an extended scale in co-operation with the Department as soon as the young plants which appear to be coming up quickly after the summer rains are sufficiently advanced The land will first be gone over with a spiked roller or sharp harrows, and the solution applied by means of a Pierson-Dobbie broadcast sprayer which will cover a strip 30 ft in width at each round Messrs A W Dobbie & Co of Adelaide have promised to lend us this machine for the experiments to be undertaken

In conclusion I may say that I feel fairly confident that the plant can be treated successfully in the way indicated if not with the bluestone solution probably a weak arsenical solution but if the latter is used stock will require to be kept off the land for some time If our experiments prove successful the Department will be justified in recommending the Hon Minister to take the necessary steps to have the 'ice plant' declared a noxious weed as it is unquestionably one of the most objectionable weeds that have invaded our farming areas

AN ENQUIRY INTO SOUTH-EASTERN CONDITIONS.

By Arthur J Perkins, Secretary for Agriculture

(Continued from Pages 307 and 340)

Final Comparison of the South-East with the Rest of the State

In preceding issues I have dealt with various aspects of South-Eastern agriculture, I have shown what have been the total gross returns from the land during the past seven years in what direction local conditions have caused farming practices to diverge somewhat from the lines that obtain over the rest of the State; and to what extent these divergences may be looked to as heralding the advent of radical changes in general practice over our more favoured agricultural districts

I purpose discussing in the present article some of the chemical features of soils typical of the district. I have already had occasion to remark that the South-East is characterised both by *extremely* rich and *extremely* poor soils; how in the aggregate these soils, favoured by local climatic conditions, compare with the rest of the State is shown in Table VI.

TABLE VI.

Showing comparatively the Average Yields of Wheat and Hay per acre during the past Seven Seasons in the South-East and the Counties of Adelaide, Hindmarsh, and Stanley, and the whole of the State:—

WHEAT.

Seasons.	South-East.				County Adelaide.	County Hindmarsh.	County Stanley.	South Australia.
	County MacDonnell.	County Robe.	County Grey.	Three Counties.				
	Bushels.	Bushels.	Bushels	Bushels	Bushels.	Bushels.	Bushels.	Bushels.
1896-1897 .	5·09	4·33	12·69	10·88	4·21	4 42	2·22	1·66
1897-1898 ..	9 98	11 03	16.32	14 77	6·09	7·50	4·33	2·64
1898-1899 ..	11·63	15·65	16·05	15 48	9·38	8 73	7·14	4·91
1899-1900 ..	10·85	8·61	10·10	9 76	8 07	8·36	6·18	4 64
1900-1901 ..	9·54	5·05	13·24	10·07	11·20	8·33	8·89	5·88
1901-1902 ..	8·07	7·27	16·18	14·62	7·76	6·45	7 71	4·60
1902 1903 ..	10·17	14·28	16·41	15·80	8 46	9·14	6·91	4·60
Average of seven Seasons	9 64	9 21	14·61	13 02	8·04	7 24	6·29	4·06

HAY.

Seasons.	South-East				County Adelaide.	County Hindmarsh.	County Stanley.	South Australia.
	County MacDonnell.	County Robe.	County Grey.	Three Counties.				
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
1896-1897 ..	0·74	0·73	1·04	0·93	0·70	0 89	0·44	0·50
1897-1898 ..	1·25	1·18	1·45	1·36	1·00	1·12	0.67	0·66
1898-1899 ..	1·16	1·18	1·45	1.33	1 20	1·01	0·75	0·82
1899-1900 ..	1·18	1·04	1·32	1·24	1·04	1·03	0·66	0·74
1900-1901 ..	1·16	1·13	1·38	1·31	1·42	1·17	1·00	1·03
1901-1902 ..	1·16	1·19	1·71	1·55	1·18	1·20	1·01	0·94
1902-1903 ..	1·03	1·11	1·80	1·58	1·21	1·16	1·02	0·95
Average of seven Seasons	1·09	1·09	1·49	1·36	1·11	1·09	0·78	0·80

In Table VI. I have looked to wheat and hay to furnish the terms of a comparison that might hold good throughout our agricultural areas. Both crops are universally grown, and their general average returns are familiar to most of us. It will be noted that in wheat the South-Eastern counties, both individually and in the aggregate, return heavier yields than the best of our more northerly counties, and more than three times as much per acre as the whole of the State. In hay County Grey alone is ahead of Counties Adelaide and Hindmarsh, and sufficiently so to place the South-East as a whole over a quarter of a ton ahead of the most favoured of our northerly counties. The figures in Table VI. express, therefore, in concrete form of what these rich and poor soils of the South-East are capable when aided by a favourable rainfall.

Chemical Features of Some Typical South-Eastern Soils.

There is no doubt that the proportions in which certain ingredients are found in soils may serve as an index to their potential, if not absolute, fertility. At times what is potentially a fertile soil remains comparatively unproductive because of known or unknown factors hindering healthy plant growth; but at no times can a chemically poor soil yield abundantly unless it be stimulated thereto by altogether artificial means. In Table VII. are given some figures that will amply bear out this position. They have reference to some chemical features of several typical South-Eastern soils. In this connection I must repeat here what are usually reckoned to be the average proportions of these substances characterising good average soils They are given below:—

Nitrogen, 0.1 part by weight, in 100 parts of soil
Phosphoric acid, 0 1 part by weight, in 100 parts of soil.
Potassium oxide, 0.2 part by weight, in 100 parts of soil.
Calcium oxide, 5.0 parts by weight, in 100 parts of soil.

These figures, on being referred to pounds per acre, 12 inches deep, and 3,250,000 lb in weight, become —

Nitrogen, 3,250 lb. per acre
Phosphoric acid, 3,250 lb per acre
Potassium oxide, 6,500 lb. per acre
Calcium oxide, 162,500 lb per acre

I now append Tables VII. and VIII —

TABLE VII

Percentage of Fertilising Substances in various South-Eastern Soils, expressed in terms of soil dried at 105 deg C —

Origin of Soils.	Total Nitrogen	Total Phosphoric Acid	Potassium Oxide soluble in strong HCl (K_2O)	Calcium Oxide soluble in cold HCl (Lime CaO).
1. Peat Land from Tantanoola .. . (Mr. Holland's Farm)	1·023	0·118	0·248	9·263
Subsoil to above	0·471	0·077	0·318	12·184
2. Black Loam from Mount Gambier . . (Mr. Sinclair's Farm)	0·384	0·164	0·207	0·389
Subsoil to above	0·193	0·178	0·180	0·338
3. Black Loam from Mount Gambier .. . (Mr. Ruwoldt's Farm)	0·269	0·157	0·175	0·374
Subsoil to above	0·112	0·112	0·155	0·343
4. Soil from Glencoe	0·222	0·112	0·116	0·367
Subsoil to above	0·143	0·085	0·112	0·294
5 Soil from Mr. T. A. Grasser, Murrabinna, Kingston	0·201	0·036	0·592	14·870
6. Reclaimed Millicent Soil . ..	2·900	0·178	0·083	8·570
Subsoil to above	0·910	0·087	0·328	11·400
7 Light Fern Land from Mount Gambier	0·045	0·010	0·019	0·070
8. Second Grade Mount Gambier Soil from Gullies	0·101	0·025	0·032	0·220

TABLE VIII.

Proportions of Fertilising Substances in various South-Eastern Soils, expressed as pounds per acre of 3,250,000 lb per foot deep :—

Origin of Soils.	Total Nitrogen	Total Phosphoric Acid (P_2O_5)	Potassium Oxide soluble in strong HCl (K_2O).	Calcium Oxide soluble in Cold HCl (Lime CaO).
	lbs	lbs	lbs	lbs.
1 Peat Land from Tantanoola, first 6 in. (Holland) . .	16,623	1,918	4,030	150,524
Subsoil to above, second 6 in. .. .	7,654	1,251	5,168	197,990
Total for first foot	24,277	3,169	9,198	348,514
2 Black Loam from Mount Gambier, first 6 in (Sinclair) .. .	6,240	2,665	3,364	6,322
Subsoil to above, second 6 in. ..	3,137	2,893	2,925	6,305
Total for first foot .	9,377	5,558	6,289	12,627
3 Black Loam from Mount Gambier, first 6 in (Ruwoldt) . ..	4,372	2,602	2,844	6,078
Subsoil to above, second 6 in . .	1,820	1,820	2,519	5,074
Total for first foot	6,192	4,422	5,363	11,152
4 Soil from Glencoe, first 6 in ..	3,608	1,820	1,885	5,964
Subsoil to above, second 6 in .	2,324	1,382	1,820	4,778
Total for first foot	5,932	3,202	3,705	10,742
5 Soil from Kingston, first foot (Grasser) .	6,533	1,170	19,240	4,833
6 Reclaimed Millicent Soil, first 6 in. .	47,125	2,893	1,349	139,263
Subsoil to above, second 6 in. ..	14,788	1,414	5,330	185,250
Total for first foot	61,913	4,307	6,679	324,513
7 Light Fern Land from Mount Gambier, first foot	1,463	325	618	2,275
8 Second grade Mount Gambier Land from Gullies, first foot	3,283	1,170	19,240	4,833

If any doubt existed as to whether it were possible to distinguish by chemical analysis between rich and poor soils, a glance at Tables VII and VIII should suffice to set it at rest In soils 1, 2, 3, 4, and 6 we have examples of soils of exceptional fertility by comparison with figures given higher up it will be noted to what extent they exceed the standard proportions of fertilising substances On the other hand, we have in soils 7 and 8 examples of poor soils, and the figures of the analyses show them to be considerably below standard requirements. In fact, the fern land approaches in composition some of the poorer Pinnaroo soils that I had occasion to examine some time back.

I readily recognise that arrays of figures, such as those given in Tables VII. and VIII., come in usually for no more than a casual glance from the average reader. I put it on record, therefore, that in the sequel I shall take up each soil separately, with a view to bring out the points that are of direct practical interest, It seems preferable, however, to dispose first of all the general tabular matter, and with this object I now append some other data mainly relative to the availability of the various fertilising substances. These are given in Tables IX. and X.

TABLE IX.

Additional Analytical Data on some Soils in Tables VII. and VIII., expressed as parts per 100:—

Origin of Soils.	Percentage of Fine Earth.	Moisture at 150° C. after air-drying.	Available Phosphoric Acid (soluble in 1% Citric Acid).	Available Potash (soluble in 1% Citric Acid).	Organic Carbon.	Organic Matter (calculated).	Relation of Carbon to Nitrogen.
	%	%	%	%	%	%	%
1. Peat Land from Tantanoola (Mr. Holland's Farm)	83·3	11·85	0·005	0·021	11·312	25·138	11·0
Subsoil from above ..	82·1	9·47	0·002	0·009	5·369	11·931	11·4
2. Black Loam from Mt. Gambier (Mr. Sinclair's Farm)	99·8	3·51	0·014	0·036	3·666	8·147	9·5
Subsoil from above ..	99·6	3·93	0·007	0·016	1·434	3·187	7·4
3. Black Loam from Mt. Gambier (Mr. Ruwoldt's Farm)	98·3	2·15	0·012	0·027	2·693	5·984	10·0
Subsoil from above ..	98·1	3·15	0·010	0·019	1·422	3·160	12·7
4. Soil from Glencoe	87·7	3·30	0·007	0·015	2·648	5·884	11·9
Subsoil from above ..	89·0	2·68	0·003	0·010	1·922	4·271	13·4
5. Soil from T. A. Grasser, Murrabinna, Kingston ..	—	6·31	0·002	0·031	—	—	—

A few brief explanatory remarks in reference to Table IX. should precede Table X. In column 1 are shown the proportions of fine earth in the different soils; that is, the material capable of passing through a sieve with one-thirtieth of an inch mesh. In column 2 are shown the amounts of moisture which the different soils retain after air-drying. It will be noticed that their capacity for retaining moisture varies within considerable limits. In columns 3 and 4 are given respectively the amounts of phosphoric acid and potassium oxide soluble in a 1 per cent. solution of citric acid. These data are supposed to indicate the state of the present availability of these substances to the roots of plants. Roots are known to exude a substance with weak acid reaction, which by contact renders soluble various substances in the soil, and, amongst others, phosphates and potassium salts. This action of the roots the chemist measures artificially by digesting the soil in question in a 1 per cent. solution of citric acid, and subsequently testing the amounts of phosphoric acid and potash which have thus been rendered soluble. In column 5 are indicated the amounts of organic carbon in the different soils; and in column 6 the organic matter. The latter is obtained by an approximate calculation, on the assumption that it contains on the average 0.45 of its weight in carbon. Finally, in the last column are shown the respective relations between carbon and nitrogen in the different soils. To a very great extent the latter figures may be taken as measuring the exhaustion of a soil brought about generally by injudicious cropping or bad farming. It is a matter of satisfaction to note that this column shows no case in which such an accusation might be levelled at the owners; in most cases, in fact, the relations are exceptionally high.

Finally, before proceeding to an individual examination of the soils in question I append in Table X. the amounts of phosphoric acid, potash, and organic matter, expressed as parts of an acre of soil 1 foot deep and weighing 3,250,[illegible] lb.

TABLE X.

Available Phosphoric Acid and Potash and Organic Matter, expressed as parts of an acre of soil 1 ft. deep and weighing 3,250,000 lb.:—

Origin of Soils.	Available Phosphoric Acid.	Available Potassium Oxide.	Organic Matter.
	lbs.	lbs.	lbs.
1. Peat Land from Tantanoola (Mr. Holland's Farm), first 6 in	81	341	408,493
Subsoil from above, second 6 in.	32	146	193,879
Total for first foot	113	487	602,372
2. Black Loam from Mount Gambier, first 6 in (Sinclair)	228	585	132,389
Subsoil from above, second 6 in	114	260	51,789
Total for first foot .	342	845	184,178
3. Black Loam from Mount Gambier, first 6 in (Ruwoldt)	195	439	97,240
Subsoil from above, second 6 in	162	309	51,350
Total for first foot . .	357	748	148,590
4 Soil from Glencoe, first 6 in.	114	244	95,615
Subsoil from above, second 6 in. . .	49	162	69,405
Total for first foot	163	406	165,020
5. Soil from Kingston, first foot .	65	1,007	—

CRITICAL EXAMINATION OF INDIVIDUAL SOILS.

1 Tantanoola Peat Soil (Mr Holland's Farm)

The chemical features to be discussed are summarised in Table XI.

TABLE XI.

Analytical Data.	First six inches.	Second six inches	First foot.
	%	%	
Percentage of fine Earth	83·3	83·1	—
Moisture retained after air drying .. .	11·85	9·47	—
Relation of Carbon to Nitrogen	11·0	11·4	—
	lbs.	lbs.	lbs.
Total Nitrogen .. .. , ..	16,623	7,654	24,277
Total Phosphoric Acid	1,918	1,251	3,169
Potash soluble in strong Acid	4,030	5,168	9,198
Lime soluble in dilute Acid	150,524	197,990	348,514
Available Phosphoric Acid	81	32	113
Available Potash	341	146	487
Organic matter	408,493	193,879	602,372

Unfortunately, I have been unable to secure any special notes as to the behaviour of this particular soil in practice, and I must confess to commenting on it somewhat in the dark. Had the results of the analysis revealed it a poor soil there would have been fewer pitfalls to avoid. We have here, however, a soil of exceptionally high potential fertility, and should it fail to rise to what might reasonably be expected of it, we must look for the stumbling block elsewhere than in its actual chemical composition.

This Tantanoola peat soil is comparatively rich in coarse material, the greater proportion of which is probably undecomposed organic matter, characteristic of similar soils. It is highly retentive of moisture, which property it owes to its exceptional richness in organic matter.

With reference to the total quantities of the substances essential to soil fertility, the position may be summarised as follows:—Of nitrogen there is roughly seven and a half times as much as what might be described as the ordinary standard for a good, average soil; in phosphoric acid the soil is not quite up to standard requirements; whilst in potash and lime the amounts recorded are respectively once and a half and twice as much as are deemed necessary in good average soils. It is fairly evident, therefore, that this soil possesses to a high degree all the characteristics of an exceedingly rich soil, with the exception, perhaps, of phosphoric acid, in which substance, however, it is considerably richer than the average South Australian soil

With organic matter it goes without saying that it is exceptionally well provided. The heavy accumulation of this substance has evidently been brought about by the defective aeration which must have characterised the lengthy periods of the past, when stagnant water ruled supreme. It is probable that in the course of time, as drainage conditions improve, tillage and general cultural operations will bring about a more rapid burning up of this organic matter, and a consequent reduction of the present high relation of carbon to nitrogen, viz., eleven. It may be added that a high proportion of organic matter, as is here recorded for this soil, always augurs favorably as to the state of availability of the mineral components of the soil necessary to plant life.

The amount of phosphoric acid and potash available to plants is represented respectively by 113 lb and 487 lb. per acre, one foot deep. By available phosphoric acid and potash is understood, as has already been stated, the proportions of these substances soluble in weak acid solutions, comparable in their action to the contact effect of roots. It should be noted that in either case the surface soil is considerably richer than the subsoil It may be stated here that the amount of phosphoric acid shown to be available is not sufficient to ensure the continuous production of heavy yields, and it is probable that phosphatic manures may, as in the rest of the State, prove remunerative. It is true that continued tillage may help to bring into a state of availability a greater quantity in future years. Of potash, for all intents and purposes, there is apparently a sufficient quantity available.

In conclusion, this Tantanoola soil, if skilfully handled, holds out promises of exceptional fertility. It is probable, however, that for the present phosphatic dressings may be required for heavy yields

(To be continued.)

"JOURNAL OF AGRICULTURE."

From January 1, 1904, the "Journal of Agriculture" will be posted to anyone resident in South Australia bona fide engaged in the cultivation of the soil on payment of a REGISTRATION FEE of One Shilling per annum. Single copies will be supplied at 3d. each; back issues at 2s. 6d. per doz. The indexes of Vols. I. to VI. can be obtained by members of the Agricultural Bureau and subscribers desirous of binding their volumes.

SOME EXPERIMENTS IN RINGING THE ZANTE.

By Arthur J Perkins, Secretary for Agriculture

In the spring of last year Mr Fulton Salter read before the Angaston Branch of the Agricultural Bureau a paper dealing with the "ringing" of the Zante currant In this paper, *inter alia* he drew attention to the defective healing of the wound when situated on a portion of the trunk exposed to direct sun rays, and recommended protecting it by means of a strip of linen rag tied with a piece of string In commenting on Mr Salter's interesting paper in our October issue I threw out the suggestion that possibly the use of grafting wax might prove equally if not more satisfactory I pointed out that the complete protection of the exposed tissues from evaporation which would thus ensue would probably result in a more rapid and satisfactory healing and thus tend to reduce the weakening action of the operation

In past years I had occasion to notice the defective healing of the incision on the Roseworthy vines due no doubt partly to exposure to our torrid summer weather and partly perhaps to somewhat unskilled manipulation I determined therefore during the present season to test the effect of grafting wax on the wounds On the whole perhaps, it is somewhat singular that we should not have thought of this before When we set about grafting a tree we know full well that the callus or healing tissue has little chance of developing unless we protect it from the desiccating action of the summer air We anoint it with grafting wax and the operation is a success Here, on the other hand, we are removing a ring of bark from the stems of our currants, and exposing to the action of the air moist surfaces that were never intended to be uncovered and yet but few of us have thought of protecting the gaping wound whilst most of us are prepared to grumble over defective unsatisfactory healing I happened to mention the matter to Mr Quinn, and he immediately suggested the use of narrow bands of cloth previously steeped in grafting wax such as are in common use amongst nurserymen I determined to follow his advice, and the College currants were divided up into lots of four, in which the individual

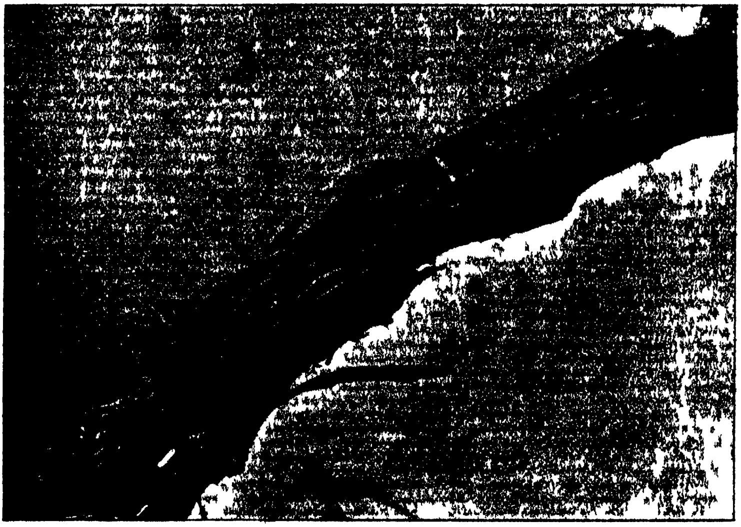

Fig I

Showing state of unprotected incision on Zante Currant vines were treated respectively as follows -On the first vine the wound was left exposed, on the second one it was immediately painted over with warm grafting wax, on the third one it was immediately firmly bandaged over with a strip of waxed calico, on the fourth one the wound was first coated with wax and then bandaged over in the same way as the third Reporting on the matter in December Mr Laffer, Superintendent of the College Vineyard, stated that three weeks after the operation the unprotected incisions were dry and bare and appreciably widening the incisions that were simply waxed over had begun to callus over whilst those that had been bandaged had completely healed over There was no difference between those that had been simply bandaged and those that had been both waxed and bandaged

It goes without saying that these results are eminently satisfactory, and as the application of a waxed bandage is an exceedingly simple and rapid operation its use can confidently be recommended to all currant growers Accompanying these notes are some photographs illustrating the results some six weeks after the ringing Fig 1 shows an incision that had been left unprotected, Fig 2 shows an incision that had been bandaged, with the preceding year's badly-healed wound immediately below (it will be noticed that the ring of callus on this year's incision is actually bulging out beyond the level of the bark). Fig. 3 shows the band of waxed cloth opened out from a well-healed incision, immediately above appears a bad scar from last year's operation

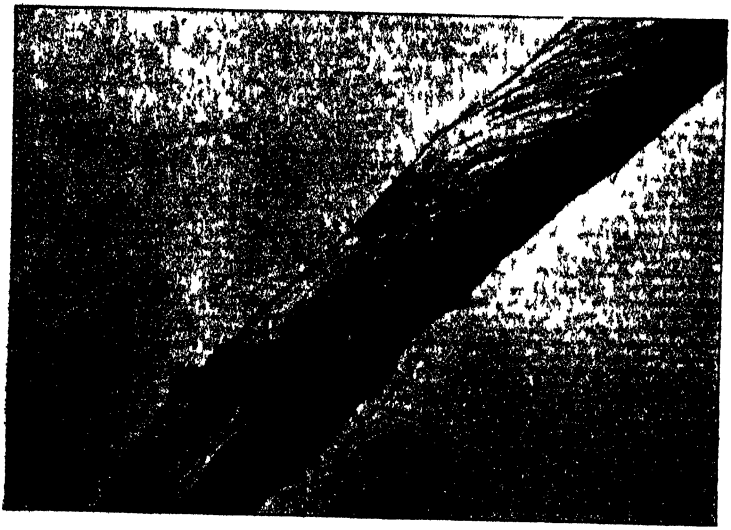

FIG II

Showing state of bandaged incision towards centre of stem preceding year's unprotected incision towards the base

At the present moment the unprotected incisions are, it is true, slowly healing over It should be borne in mind, however, that an unprecedentedly cool and moist summer has unquestionably favoured the healing process in the exposed wounds With us in normal, hot dry seasons the results have usually been far less satisfactory Further as is apparently the case, since a check, or a certain amount of weakening, is essential to the good setting of the fruit, it may reasonably be argued that the sooner the damage is repaired the less are the plants likely to suffer from its effects

It was, of course, quite possible that the rapid healing of the wound induced by bandaging might have had an injurious effect on the setting of the fruit. It is satisfactory to note that, so far as the present season's results are concerned at all events, no difference can be detected between the setting of the fruit on the vines with rapidly healed wounds and those still in the process of healing.

There is another reason why the use of waxed bandages over the incisions should commend itself to currant growers. It is a matter of very general experience that the weakening effects on the vines are minimised by the removal of as narrow a layer of bark as possible. The comparatively mild effects of a narrow incision may be attributed, I believe, mainly to more rapid healing of unprotected incisions. Unfortunately to cut a very narrow strip of bark out of a thick stem is both a tedious and a slow operation, involving the grower in some considerable expense in labour. Now, whilst I am far from advocating the removal of an unnecessarily wide strip of bark, I am of opinion that a strip from one-eighth to one-quarter of an inch in width may with safety be removed, providing the wound is immediately bandaged with wax cloth. It follows that bandaging should not only hasten the healing of the wound, but it will also lessen the cost of "ringing."

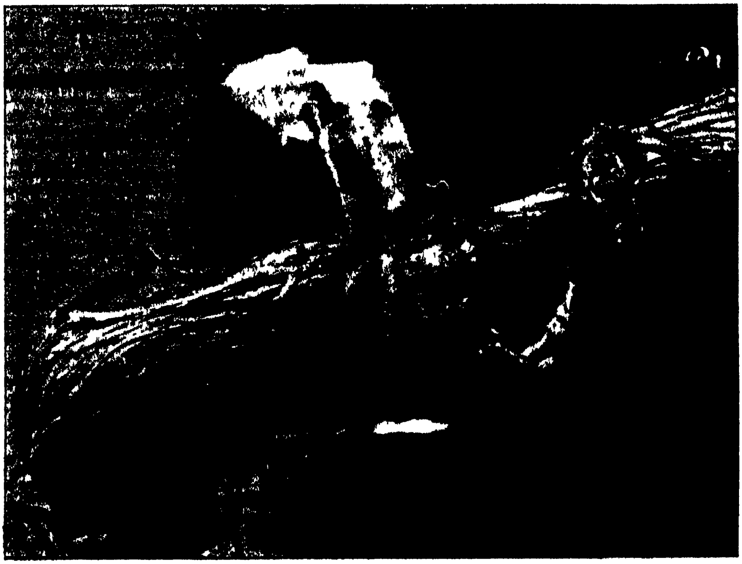

FIG. III.

Showing bandage used for bandaged incision; preceding year's unprotected incision higher up.

Whilst in Angaston some time back I noticed that one grower had, for experimental purposes, no doubt, covered his incisions with clay, bound to the stem by a piece of cloth. It is probable that the results obtained will be satisfactory; but just as clay is inferior under our climate to wax for grafting purposes, so it is likely to be in this case. Further, its application is certain to be far more laborious and expensive than that of a strip of waxed cloth.

ALLEGED INTRODUCTION OF THE QUEENSLAND FRUIT FLY.

In response to request from the Hon. Minister of Agriculture for a report on the alleged introduction of the Queensland fruit fly in imported bananas and the newspaper correspondence thereon, Mr. Geo. Quinn, Inspector of Fruit, reported as follows:—

The whole of this alarm appears to have originated in a case of mistaken identity. As far as I can gather the facts of the case are as follows:—On Saturday, December 19 last, Mr. J. J. Bishop, Manager of the S.A. Fruit and Vegetable Company, carried some bananas from the city to his home at Norton's Summit. On examination these proved to be infested with maggots, and Mr. Bishop appears to have concluded that if maggots were present in bananas they must of necessity be the larvae of the dreaded fruit fly of Queensland. On the Monday morning following Mr. Bishop drew the attention of Inspector Rowell to the maggots in some more bananas of the same lot which were in possession of the Fruit and Vegetable Company at their depot in Adelaide. Mr. J. H. Cowling was also present, and was advised by Mr. Rowell to bring the fruits with the maggots in them to this Department for identification. Instead of this, however, he took them to the *Register* Office and secured the insertion of the statement that the bananas were infested by the Queensland fruit fly.

Some of the bananas containing these maggots were brought to the office by Inspector Rowell, and I examined the insects, and expressed the opinion that they were the progeny of the small fly which frequents places wherever fruits are undergoing fermentation and decay. I examined the bananas also, and felt confident the maggots were not those of the fruit fly of Queensland, because of the method of attack being so utterly different. The insects themselves were differently marked, and their movements and size also distinguished them from the Tephritis. These maggots had begun work *in the ends* of the bananas, where—owing to having been wrenched from their stalks—the fruits had begun to decay. The true fruit fly punctures the softening banana at any point upon its surface. The maggot, resulting from the egg deposited in the puncture, at once finds itself in contact with the pulp beneath the rind, and it starts to burrow in any direction. Such infested fruits rapidly soften, and on being handled the liquid contents begin to ooze through the holes whence the attack began, but which have since become enlarged by decay. When the maggots are fully grown they invariably crawl out of the fruits to pupate, and, under natural conditions, bury themselves in the soil for such a purpose. Mr. W. W. Froggatt, the able Entomologist to the New South Wales Department of Agriculture, states from personal observation that they will attach themselves to paper or to the sides of wooden cases in which the infested fruits may have been packed, and pupate in that position.

The bananas brought by Inspector Rowell were placed in a hatching jar in this office on December 21: and on December 29, when I returned after the holidays, many of the insects had transformed, and scores of the flies were present in the jar. These maggots pupated in the decaying fruit, and, as far as I could see, did not enter the soil placed in the jar for them. The flies were submitted to Mr. J. G. O. Tepper, F.L.S., the Entomologist of the South Australian Museum, who, after a close examination, kindly wrote that in his opinion they belonged to an unnamed species of Muscides (true flies), and were [illegible] open at Thorndon Park and Burnside as early as 1885 and 1886, so it must be indigenous, and not imported with the bananas from which it had been hatched, but infested them since they came into the local stores. As they have been seen proceeding from banana peel rotting in a dust box, I presume that the flies deposit their eggs on overripe and putrefying fruits generally."

I think the writers of these letters to the public Press are not to be commended for the method by which they start a rumour that this pest, against which all the States are up in arms, has been carried into some fruit-growing districts of South Australia. Such a statement cannot be recalled, no matter how erroneous it may be, and persons who are so disposed in the other States may use it as a lever to put fresh impediments in the way of our fruits which may be sent to compete in their markets. To talk of prohibition, without considering the spirit of retaliation which its practice engenders, is certainly the result of one-sided reflection.

The accusation of neglect on the part of the Inspectors, which forms the keynote of Mr. J. H. Cowling's complaint, I pass over as possessing all the value attachable to "hearsay" evidence, as that grower has to my knowledge never witnessed the methods of inspection we now apply to imported fruits. Mr. Merchant's somewhat hasty conclusion is based on mistaken identity, and I have no doubt when he becomes fully cognisant of the actual facts of the case he will recognise the position. Mr. Grasby's contribution deserves all of the consideration which can be claimed for the statements—(that our "system of inspection, though of some value, is no safeguard, and often a perfect farce")—of one who first pronounces sentence and then considers the proving of the truth of the allegations a mere secondary superfluity. If the writer's observations are to be judged according to their accuracy they stand self-condemned. If in their explicitness we are to seek useful ideas, there is much unravelling of those reservations—so characteristic of the writer—to be done. I am in doubt as to whether I should feel obliged to Mr. Grasby for telling the public he thinks my officers do their best, when the whole of the context of his letter implies how poor, in his opinion, that best is. We do not shrink from the investigations of those who, possessed of sufficient knowledge, will take trouble to genuinely investigate our actions in the performance of our public duties, nor do we resent criticism founded on such investigations. It may be news to Mr. Grasby to be informed that, in connection with the inspection of imported fruits, the whole of the work of handling and inspecting is done by officers paid by the Government; and where the "outwitting," which is so disingenuously attributed to the merchants can come in, when those men practically do not see the fruit until the officials have done with it, will probably puzzle any individual who is possessed of a less elastic imagination than Mr Grasby. The only point on which he has committed himself to a decided course is that, in the opinion of Mr. Grasby, "bananas should be prohibited during the fruit season." Such a statement is very vague, and could only be made by a person who has but the most superficial idea of the subject under discussion. During the past five years, in which we have been inspecting bananas, the larvæ of the Queensland fruit fly has not been detected in any fruits arriving here other than during July, August, and September. The contention that this insect would not thrive here has not been advanced by any officer of this Department as far as I am aware. A doubt respecting the position has been expressed because thousands of cases of Queensland bananas were poured into Victoria and South Australia before any restrictions existed, and yet no outbreak occurred. There is a certain amount of support to this in the fact that scores of larvæ of this insect put in jars here in August have not survived or developed into flies, even though some did reach the pupal stage.

CORRESPONDENCE.

CODLIN MOTH.

To the Editor.

Sir—As Secretary, my Branch instructs me to reply to Mr. Monks' letter in the January number of *The Journal*. "Some of the delegates" was not mentioned in our minutes (October 31), as sent in, which read:—"Mr. Oinn showed samples of Gravenstein apples quite the size of ordinary marbles, and fully justifying his reference to them in his paper at Conference." Also, "Mr. Oinn called attention to the fact that he had noticed first empty chrysalis during third week in October." We differ from Mr. Monks in that we consider there is a decided difference in the time trees of same variety flower, etc., whether on high hill or gully ground, for instance, and in cultivation; and certainly, when there is eight or ten miles between the Forest Range orchards and ours, there may be some radical difference, let alone the trifling one—a week or ten days—he mentions. Every grower knows that the whole style of the country the other side of Summertown is different from ours, and we consider that before Mr. Monks wrote his letter he should have seen Mr. Oinn's Gravensteins for himself, whilst in these parts. Fruit is not all earlier this season, and Gravensteins are amongst those sorts that are not.—I am, Sir, etc.,

Wm. H. Hughes, Longwood Branch.

[The reference to "some of the delegates" was made by the Editor to explain the reason why the exhibit was made.—Ed.]

NOTES ON PACKAGES USED AND METHODS OF PACKING FRUITS FOR EXPORT.

By George Quinn, Horticultural Instructor.

Next to being able to produce first-class fruits to meet the requirements of outside markets comes the question of safe transit. It is true, the temperature and storage conditions maintained during the journey may be said to hold the key to the position; but, granted that the treatment in these respects on the voyage is in keeping with our present knowledge respecting what has proved successful in the past, the next consideration is the adoption of suitable packages into which the carefully selected and graded fruits should be securely encased.

On the following pages I have figured a few of the packages which have thus far proved most suitable for the safe carriage of various kinds of fruits. The Australasian exporters of apples to London are indebted to Tasmania for the establishment of this trade on an assured basis, and it is only natural to expect that out of their wider experience some alert mind among the shippers from that State would evolve a suitable package.

Plate I.
The Peacock Apple Case.

The case now known as the "Peacock" case—from the name of the gentleman who first suggested it—is fast becoming the recognised standard for the European as well as the interstate trade in apples. The case has outside measurements of 10 x 15 x 20 inches, so that if necessary in stacking the cases they will cross-pack exactly, thus rendering the bond in the pile as complete as that secured by the bricklayer in his wall-building. It is claimed that this results in economy of the shipping space, enabling two or three cases more to be stored in a measured ton than was possible with the older styles of cases. When made from Tasmanian hardwoods, battens ⅜ in. in thickness are used in the sides, top, and bottom, and the ends are cut from boards ¾ in. thickness. With our softer imported pine woods, the ends need to be ⅞ in. or ⅝ in. timber; and some of the side battens from ½-in. material.

Mr. James Lang, the well-known fruitgrower, of Harcourt, Victoria, has suggested a modification in the thickness of the timber used in the battens which form the sides. This has been adopted here with conspicuous success, and the refrigerating engineer of the Orestes declared the cases shipped in that boat, which were made on Mr. Lang's plan, to be the best he had met. The modification is simply that the sides—the 20-in. side- are each made of four battens, two of which are ½ in. thick and two ⅜ in. thick. In construction the battens ½ in. thick are nailed on the outer edges of each side and those ⅜ in. thick are placed side by side between them. This has two advantages, for not only does it give stability to the cases, but when they are laid on their sides in the ship or stack the thick battens of the upper case always rest upon those of the case beneath it. The thin, or ⅜-in., battens then are opposite and parallel to each other, affording a ventilation space of a quarter of an inch between each tier of cases, which cannot be omitted by careless stacking or removed by the shifting of dunnage or by splintering off, as was so often the result when a lath was tacked to the end of each case. To secure the proper "tightening" of the contents, when nailing down it is desirable that the top of each of these cases should be made from one piece of board rather than of two battens. When made as described above the cubic contents of this case is a fraction over 2,331 in. As an Imperial bushel contains 2,218.192 cubic in., the buyer secures full measurement when he purchases the contents as a bushel of apples. The spaces between the battens on the sides should not exceed ¼ in., otherwise there is danger of sufficient of the convex surface of the fruits being squeezed in between the sharp edges, and thus being seriously bruised or cut. Rats also insert their sharp noses between

PLATE II.
Case of Oranges, as packed for export.

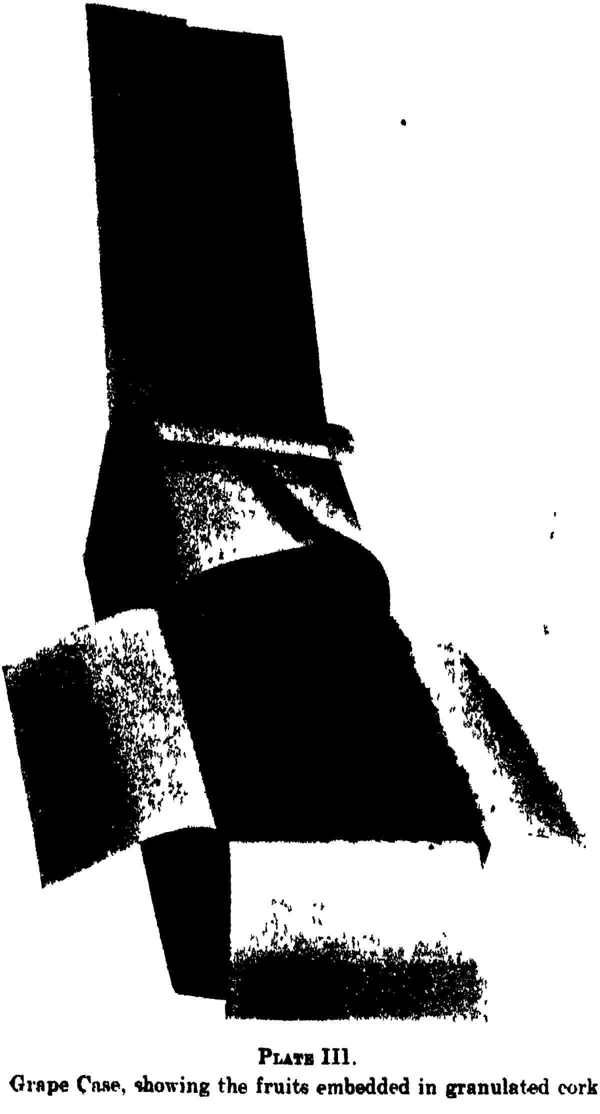

PLATE III.
Grape Case, showing the fruits embedded in granulated cork.

wider spaces and I have seen pieces which a shilling would not conceal eaten out of row after row of fruits in cases stacked overnight in wharf sheds

In the filling of the cases it should be needless to repeat that only evenly-graded sound apples of well-proved varieties which have wilted for a few hours after being picked should be wrapped and packed for export If possible grades which will allow the apples to be placed in the cases on their flattest sides or shortest diameters should be selected If however a few have to be turned edgeways to fit in securely it is better to follow that plan than to insert smaller fruits or permit slack packings Respecting the use of wood wool it is only necessary to use enough to fill gaps into which fruits of even grade cannot be fitted while a good pad on the bottom before beginning to pack and on the top prior to nailing down the lid is valuable If the bottom and top layers have the crown or calyx ends facing outwards, the appearance of the contents is enhanced when the cases are opened for sale

The case figured in Plate II has been used for the carriage of oranges to Europe Its outside measurements are 9 x 13 x 28 in The ends and partition are made of wood ¾ in thick and the sides of laths ⅜ in thick, the top and bottom being each composed of a single board ½ in in thickness A small lath cleat ¼ in thick, was usually nailed across each end for ventilation purposes This was the case formerly used in the apple export trade from this State

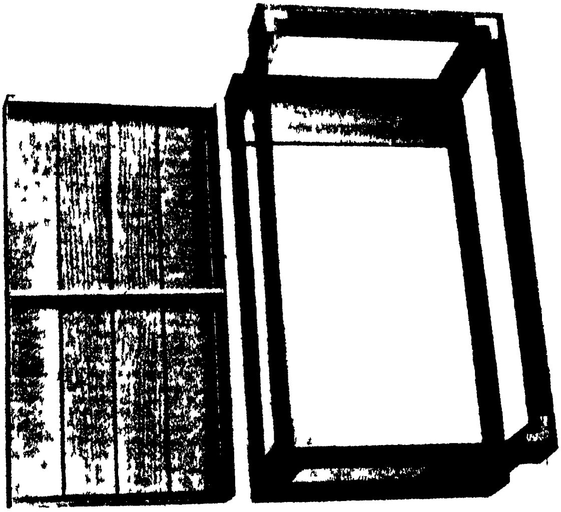

PLATE IV

Peach Crate with tray to fit into same

In packing oranges besides paying great care to the quality soundness, grading, variety, etc sent much depends upon the proper wilting or toughening of the skins before the final packing is performed To attain this the fruits must be allowed to stand in a shed or shelter for several days after being cut from the trees until considerable evaporation has taken place from the skins The fruits are then wrapped separately in paper and, after putting in a pad of wood wool they are packed in rows until the case is filled somewhat above the top Another pad of wood wool is placed over the fruits, the lid adjusted and the case rocked endways sharply to settle them down When properly wilted oranges may be packed very firmly As with the upon the thick outside framework of battens, but the contact of the foot of the workman would be fatal to the thinner wood: and, unfortunately, this is a contingency which arises only too frequently in the handling of fruit in transit.

The cherry crate figured in Plates VI. and VII. has been used very extensively in interstate export. This crate has outside dimensions as follows:—27¾ in. long, 13½ in. wide, and 11 in. deep. The ends are made of ⅝-in. boards. Three battens, each 3 x ⅜, are used on each side, four on the bottom, and the top is formed of two pieces each 6 in. wide. This crate holds twelve chip punnets, in three tiers. Each punnet has a capacity of 4½ lb. of cherries. The punnets are 12½ in. long, 6¼ in. wide, 3 in. deep, with a partition across the centre. A small external cleat, ⅜ in. thick, is nailed upon each end of the punnet.

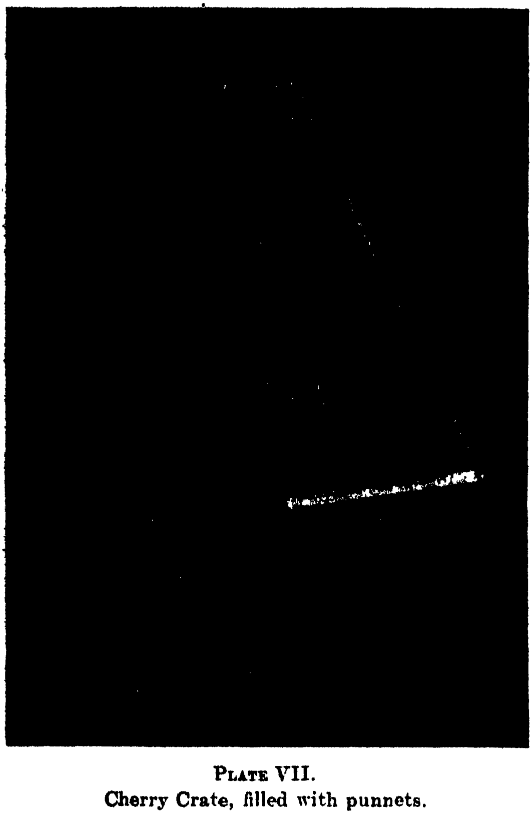

PLATE VII.
Cherry Crate, filled with punnets.

The cherries are gathered dry and packed in the punnets, settling them down closely by gently shaking the punnet from time to time. When a layer of punnets is placed in the crate a layer of wood wool is spread over the fruit, and so on, until the crate is filled. The layer of wood wool used before putting on the lid must be sufficiently thick to make the whole of the contents firm. The varieties found most suitable for carrying are those known in this State as Bigarreau Napoleon, Waterloo, St. Margaret's, and

Florence. The greatest care must be taken to exclude split, bruised, or wet berries from the packages.

The package figured in Plate IX. is likely to prove of considerable value in the transportation of pears to Europe. It consists of three trays joined together by an external cleat fastened to each corner. These trays have been used with success in the export of pears from Victoria to London, and I am informed the Tasmanian growers have also adopted the principle in their oversea trade. As far as I am aware, the only grower who thus far has adopted these packages here is Mr. G. R. Laffer, of Belair, through whose kindness I have been able to figure them here. I would suggest the trays should be made of such dimensions so that when three are united, as shown in our illustration, a package will be formed with proportions equal to those of the Peacock apple case. To attain this end they should be made as follows:—The sides be composed of battens 19¼ in. long, 8 in. wide, ⅜ in. thick. The lids—one of which is required for every three trays—should be composed of four pieces, two of which should be 19¼ in. long by 3¼ in. wide by ½ in. thick, and two 19¼ x 3¼ x ⅜. The bottom of every third tray should be made of exactly similar dimensions, while that of the other two trays should be made of four pieces, each 19¼ x 8¼ x ⅜. This variation in thickness will give the ventilation described as having proved so successful in connection

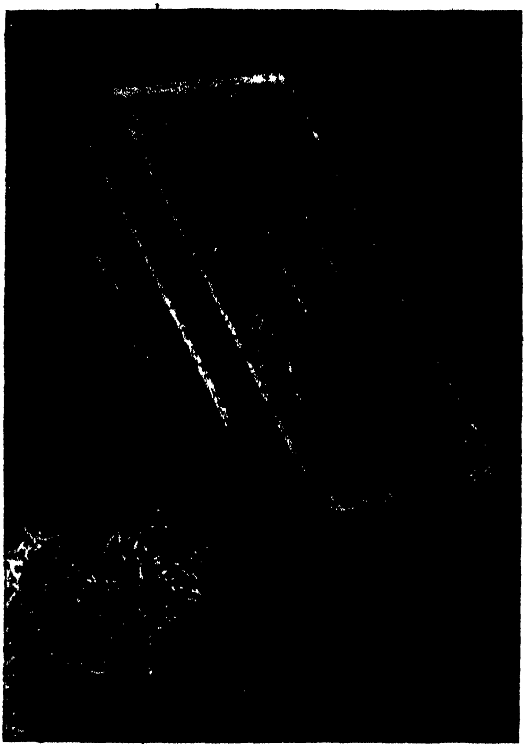

PLATE VIII.

Cherry Crate, showing ventilation spaces and punnets.

with the Peacock apple case. The ends are each composed of three pieces 9½ long x 3 in. x ⅜. The four cleats (one used at each corner) each measure 9 in. x 3 in. x ⅜ in.

When packing the pears a tray with the two ½-in. battens on the bottom is packed first. The fruits are each carefully wrapped in a piece of tissue paper and packed into wood wool -long pears on their sides, short ones upright. When the tray has received its complement of fruit wood wool is carefully packed between them, and a good thick layer placed over the top The second and third trays are packed similarly and placed in a pile. The lid is then nailed on to the top tray, placing the ½-in. thick battens on the outer sides. The ends of the three trays are then adjusted and the cleats nailed on, taking care that, while the nails take a "dove-tailing" direction into the wood of the trays, they shall not penetrate to the fruits.

PLATE IX.
Pear Crate, composed of three trays, also tray showing method of packing.

ANALYSES OF FERTILISERS.

By W. L. SUMMERS, INSPECTOR OF FERTILISERS

The following results of analyses of samples of fertilisers obtained by myself during the past two months are published for general information. In each case the certificate of constituents, or guarantee registered by the vendor, is shown in brackets, thus (36 per cent), immediately before the results of the analyses.

Up to date of writing relatively small quantities of manure have arrived, owing to the protracted voyages of several vessels. As additional samples are obtained and tested the results will appear in *The Journal*:—

AUSTRALASIAN IMPLEMENT COMPANY'S Shirley Superphosphate (three samples).—Water-soluble phosphate (36 per cent.), 36 per cent., 34.3 per cent., 35.4 per cent.

Elder, Smith & Co's Ceres Superphosphate.—Water-soluble phosphate (36 per cent.), 38.7 per cent.

Elder, Smith, & Co.'s Lawes' Superphosphate. –Water-soluble phosphate (36 per cent.), 39 per cent.

Norman & Co.'s Superphosphate.—Water-soluble phosphate (35 per cent.), 38.7 per cent.

George Wills & Co.'s United Alkali Company's Superphosphate.—Water-soluble phosphate (36 per cent.), 37.4 per cent.

Adelaide Chemical Works Co.'s Mineral Superphosphate.—Water-soluble phosphate (36 per cent.), 41.9 per cent.

Adelaide Chemical Works Co.'s Bone Superphosphate.—Nitrogen (2.1 per cent.), 1.8 per cent.; water-soluble phosphate (15.2 per cent.), 22.8 per cent.; citrate-soluble phosphate (15.8 per cent.), 12.2 per cent., acid-soluble phosphate (6.8 per cent.), 4.3 per cent.

Adelaide Chemical Works Co.'s Guano Superphosphate.—Water-soluble phosphate (25 per cent.), 34.4 per cent.; citrate-soluble phosphate (5 per cent.), 1.5 per cent.; acid-soluble phosphate (3 per cent.), not tested.

Adelaide Chemical Works Co.'s Bonedust.—Nitrogen (3.5 per cent.), 3.7 per cent.; acid-soluble phosphate (45 per cent.), 43.4 per cent.

Crompton & Son's Bonedust. Nitrogen (3.9 per cent.), 3.9 per cent., acid-soluble phosphate (44.67 per cent.), 45.2 per cent.

SORGHUM HAY.

Sorghum is rarely utilised except for feeding green or for converting into ensilage. In a season like the present, when, owing to the bountiful summer rains experienced, there is in many places a good natural supply of green herbage, the sorghum is consequently not required for that purpose. Where this cannot be conveniently made into ensilage, farmers may, perhaps, be surprised to learn that, according to *The Texas Stockman and Farmer*, it can be converted into good hay. The following extract describes the method of making sorghum hay:—

"Sometimes, especially during moist weather or in wet localities, difficulty is experienced in curing the hay on account of its susceptibility to rot under such conditions. Ordinarily, however, sorghum can be cured with comparative ease. It may be cut with a mower, corncutter, or self-binder. If the former are used the best method to follow is that of Professor Connell, of the Texas Experimental Station, which is as follows:—

" 'After mowing, which is done when the seeds are partially ripe, allow the sorghum to lie on the ground sufficiently long to dry out at the end of the blades. If the crop is thick it should be turned over on the ground to expose the bottom portion of the crop to the sun for a short time. Usually, one full day's sun is required to dry it sufficiently to be put into the cock. These haycocks may be 5 ft high and 4 ft. in diameter, of the shape of an old-fashioned beehive. All of the hay put up in this manner should be well settled as it is laid on the pile. After having constructed it to the proper height, rake the loose sorghum away from the sides, leaving a neat pile of hay that will turn water in time of rain. Allow it to remain in this shape for two or three days for fermentation to take place, which is evidenced by the heating and the deposit of dew upon the interior of the cock. When thoroughly warm, and before the hay loses its natural colour, open the cocks and expose the hay to four or six hours' sun, according to the weight of the crop per acre and the size of the stacks. Then the hay is ready to haul to the barn or be placed in stacks, where it may safely be expected to remain without moulding or heating further. If the hay is allowed to remain in the cocks too long, the fermentation proceeds too far, and the hay sours and then rots in the field. It will remain longer in the cocks without damage the less of water or sap it contains when put up. Use no salt or other preparations to preserve the hay. The hay may be baled safely if given six to ten hours' sun from the cocks, depending on the size of the stalks.

" 'When a self-binder is used, a method greatly followed in East Texas is to allow the bundles or shocks to remain in the field about eight or ten days, putting together a number of bundles leaning against each other, and inclined at the top so as to shed water. After that they may be put up in stacks or taken to the barn.' "—*New South Wales Agricultural Gazette.*

COUNCIL OF AGRICULTURE.

The monthly meeting of the Council of Agriculture was held at the office of the Department of Agriculture on Wednesday, January 18, 1904, all the members but Mr. Thos. Hardy being present.

The Minister of Agriculture forwarded report by Professor Towar on the Roseworthy College examination results. The Professor attributed the low results to (1) the lengthened absences of several students owing to accidents and illness; (2) several students, without the mental calibre or who are too lazy to work, exercising an influence the reverse of wholesome over many of their fellow students; (3) to the fact that, as only the final third year examinations carry weight in connection with the College diploma, a number of students appear to care but little for the percentage of marks gained at the sessional examinations, several not even attempting some of the papers. He thought that this difficulty would be remedied by making every study and every examination count in the diploma work. The Hon. Minister intimated his intention of asking the Council to appoint one or more of its members to act with an expert educationalist as a committee to enquire into the matter after the diploma examinations were concluded.

The Secretary stated that the Council's request that the Government should indicate its intentions in reference to the sale of codlin moth apples had been forwarded to the Hon. Minister, who had announced that the Department would not enforce the law against the sale of such fruit this year. Considerable discussion ensued, and several members blamed the Government for its action in this matter, it being generally held that the decision to permit of the unrestricted sale of infested fruit would deal a heavy blow to the apple industry. Mr. Laffer thought the present Government was not so much to blame as those members of Parliament who supported the motion that was carried in the House of Assembly some twelve months ago. This question was made a political matter by a section of the growers, and to secure votes the members of Parliament had taken action which, as one interested in the industry, he could only regard as a retrograde step. Neither was the decision of the Government consistent. For years the sale of infested fruit had been prohibited, although the growers were not in a position to deal with the pest in their gardens satisfactorily; but now, when it had, at considerable expense, been proved that arsenical spraying is absolutely effective, the restrictions on the sale of the fruit were abolished. Our apple industry was assuming very large proportions, but growers were now faced with a serious difficulty. Col. Rowell and other members agreed, and, on the motion of Col. Rowell, it was unanimously resolved that the Council desires to express its regret at the decision of the Government, and requests that the question be reconsidered.

The Minister forwarded considerable correspondence respecting alleged damage to butter on the railway in transit from Yongala and Petersburg. It was decided to refer the matter to Messrs. Caldwell and Sandford as representing the dairy industry.

In reply to a question the Secretary stated that the Dairy Instructor had not advised the Department as to whether he had accepted the position of Dairy Expert for Queensland, as stated in the daily papers.

Messrs. Caldwell, Miller, and Molineux promised to attend Conference of Northern Branches, at Gladstone, on February 10.

The following gentlemen were appointed as members of the undermentioned Branches:—Penola, Mr. J. Alexander; Lucindale, Mr. W. G. Williams.

Mr. Miller referred to the question of the destruction of rabbits. These were increasing at an enormous rate in many parts of the farming areas, and it was imperative that vigorous action should be taken to deal with them. Parliament had in the Vermin Acts recognised the absolute necessity for simultaneous action in destroying rabbits and had given the District Councils power to fix a time for such action. Unfortunately, however, no attempt appeared to be made by the Councils interested to secure continuity of action, with the result that different dates were fixed. As an instance of this he mentioned that some of his land was in the Mundoora District, and that Council had ordered the destruction of rabbits for one month from January 14; in the adjoining District of Pirie he also held land, and here the date fixed by the Council was from February 14. This resulted in less effective work being done throughout both districts, and he moved that the Minister be asked to bring under notice of the District Councils the necessity for securing simultaneous work in rabbit destruction in districts bordering on one another. The motion was carried unanimously

Mr. Marshall tabled a list of rust-resisting wheats and was thanked for same.

RUST-RESISTING WHEATS.

The following list of rust-resisting and rust-escaping wheats has been furnished by Mr. R. Marshall, late of Hope Farm, Templers, at the request of the Council of Agriculture:—

Variety.	Season of Ripening.	Rust resisting or Rust escaping	Raised by
Comeback ..	Early	Rust resisting	W. Farrer (N. S. Wales)
Yandilla A. ..	,,	,,	,,
Rerraf	,,	,,	,,
Bartlett's Crossbred	,,	Rust escaping	Bartlett
Steinwedel ..	,,	,,	A. Steinwedel, Balaklava
Newman's Early *	,,	,,	Newman
Early Para ..	,,	,,	A. B. Robin, Nuriootpa
Early Purple ..	,,	,,	—
Marshall's Early .	,,	,,	R. Marshall
Marshall's Early Solid Straw ..	,,	,,	,,
Early Morn ..	,,	,,	,,
Baker's Early ..	,,	,,	G. Baker
Marshall's No. 5..	Early Mid-season	Rust resisting	R. Marshall
Alpine	,,	,,	,,
Hercules	,,	,,	,,
Marshall's No. 3 .	Mid-season	,,	,,
Marshall's No. 4..	,,	,,	,,
Marshall's No 6..	,,	,,	,,
Marshall's No. 7..	,,	,,	,,
Marshall's No. 8..	,,	,,	,,
Marshall's No. 10..	,,	,,	,,
Marshall's No 11..	,,	,,	,,
Marshall's No. 29.	,,	,,	,,
Marshall's No. 33..	,,	Very resistant	,,
Marshall's Prolific..	,,	Rust-resistant	,,
Ceres	,,	,,	,,
Silver King ..	,,	,,	,,
Majestic ..	,,	Very resistant	,,
Gallant	,,	,,	,,
Jonathan ..	,,	Rust-resisting	W. Farrer (N. S. Wales)
Bobs	,,	,,	,,
Kivin	,,	,,	,,
South Australian Wonder ..	,,	,,	A. B. Robin, Nuriootpa

* Neumann's Early ?

A number of returns concerning rust-resisting wheats have been received from the Branches of the Bureau. It is particularly requested that all Hon. Secretaries will make a point of returning before February 21 the forms giving the information required, as it is important that the complete list of rust-resisting wheats should be published in the March issue.

LOTUS AUSTRALIS.

Lotus australis is a perennial herb, common to most parts of Australia. The plants vary in size according to the climatic and soil conditions of their surroundings. On the coast sandhills and on the embankments along the railway line through the hills they often form large, straggly, and generally circular bushes, up to 2 ft. in height and 2 ft. 6 in. to 3 ft. 6 in. across, and covered with numerous flowers. On the other hand, we have at various times during the dry seasons received from the pastoral areas complete flowering specimens consisting of a single stem, 6 to 9 in. in height, bearing a few flowers at the summit. The leaves, which are of a dull green colour, consist of five small leaflets, three of which are at the end of the stalk, and the other pair at the base, near the stem. The plant bears pretty, pea-shaped flowers, varying in colour from white to purplish, but generally pink, forming umbels at the end of a stalk, often several inches in length. The seedpods are cylindrical in shape and from 1 in. to 2 in. in length. A variety of this plant, Lotus australis var. Behrianus, is generally much smaller, usually decumbent, with leaves small and broad. flowers small, dark reddish in colour, and borne singly or in twos or threes on a short stalk.

Stockowners hold very diverse opinions as to the merits and demerits of Lotus australis and its variety. In the early days of the State the larger form was regarded as a valuable fodder, and was called "native lucerne," a name by which it is still known in many parts. Many stockowners regard it as a very valuable, drought-resisting fodder plant, and quite recently a gentleman holding some poor, sandy, scrub land in the hills south of Adelaide enquired as to the possibility of clearing this land and sowing it to Lotus australis, thus converting it into usual pasture. That the plant is eaten by stock with relish and impunity in most instances there is undoubted proof. I believe that penned sheep have been fed with it largely without any ill effect, yet there is no question that it has been responsible for the deaths of numerous stock. In many parts it is called "poison weed" but the opinion of a good many experienced stockmen is that it is only injurious when hungry stock partake to excess of the foliage and seeds, death being the result of acute inflammation, or bloat, especially when it is eaten while wet with dew or rain.

Analyses have proved that, at certain stages of development at least, the Lotus australis, like sorghum and some other plants, contains a small percentage of prussic acid

ROSEWORTHY COLLEGE WHEAT EXPERIMENTS, 1903-4.

By J. D. Towar, Principal Agricultural College.

VARIETY TESTS.

The variety tests were conducted in the central portion of Field No. 6 and in Field No. 8. The soil in No. 6 is of medium quality, which has been under good cultivation and manuring for a number of years. That in No. 8 runs into the limestone and sand, and is not considered so productive.

Unfortunately, with large plots, three to six acres each, and the showery weather prevailing at seeding time, a considerable time elapsed between sowing the first and finishing the last of the varieties. The weather and condition of the soil were such that we were obliged to stop the varieties for a while, and devote the time of the teams to another set of plots. As will be seen by the table, there was a period of over two weeks between the beginning and the end of the seeding.

As a means of compensating for these differences in the nature of the soil and the time of sowing, thereby bringing all the varieties to the same comparative basis, the King's Early, a variety which seems to thrive well under all conditions on the College Farm, was inserted frequently among the variety plots. In the table a percentage comparison is made, using the King's Early as a standard, placed in every case at 100 per cent., or points, as explained in the notes below.

The treatment of the soil, the manuring, and the harvesting were as uniform as the conditions of the weather would permit. The drill was set

to sow 2 cwt. of manure per acre, and was kept in that condition throughout the experiment. The seeding, too, was planned to be perfectly uniform, yet the difference in the size of the kernels and the rate of the flow accounted for the variations in the amount of seed applied, except in the case of the Russian wheats, where the quantity of seed was so small that a lighter seeding was necessary in order to cover the required area. All of the seed was subjected in the usual manner to the bluestone treatment for smut. The crop showed practically no trace of the smut fungus.

VARIETY TESTS

TABLE I.—*Showing Results*

Varieties arranged in the order grown.	Date of Sowing.	Seed per Acre.	Yield per Acre.			Percentage Comparison (King's Early as standard)		Earliness.	Remarks on Rust.
			Hay.	Grain.		Hay	Grain		
		lbs.	lbs.	bus.	lbs.				
1. Fan .. .	June 1	75	2,342	16	57	95	128	Medium	Rust-resistant
2. King's Early ..	1	81	2,454	13	27	100	100	Early	,,
3. Smart's Pioneer ..	1	80	2,454	12	18	92	86	Med. to early	Rust-affected
4 Gluyas .. .	1	71	2,412	19	10	90	135	Early	Rust-proof
5. Jerkin . .	1	72	2,264	11	36	85	82	Med to early	Rust affected
6. King's Early ..	May 30	80	2,889	15	0	100	100	Early	Rust-resistant
7. Majestic	30	81	3,074	15	17	107	96	Med. to late	Rust-proof
8. Neumann's ..	30	79	2,778	13	20	97	84	Med. to early	Rust-affected badly
9. College Selection .	29	76	3,176	17	20	111	109	Early	Rust-resistant
10. Warwick . ..	29	79	2,713	12	51	95	81	Med. to ear y	Rust-affected
11. Purple Straw ..	29	81	2,852	10	11	100	64	Late	Rust-affected badly
12 King's Early ..	29	81	2,852	16	44	100	100	Early	Rust-resistant
13. Marshall's No. 3 ..	28	80	2,806	10	53	92	61	Late	Nearly rust-proof
14 Leak's Rust proof .	28	70	3,183	9	38	104	54	,,	Rust-affect'd slightly
15. Dart's Imperial ..	28	79	3,389	10	11	112	57	,,	Badly rusted
16. Defiance	28	70	3,139	8	17	103	47	,,	,,
17. King's Early .	28	81	3,222	18	53	100	100	Early	Rust-resistant
18. ,,	17	75	—	22	4	—	100	,,	,,
19. Boomerang . .	17	75	—	18	0	—	82	,,	,,
20. Waddy	17	75	—	15	0	—	68	,,	,,
21. Russian . .	16	60	—	10	36	—	48	Late	,,
22. Nipepooz . .	16	66	—	15	22	—	69	,,	,,
23. Galland's Hybrid .	16	85	—	12	13	—	55	,,	,,
24. Medeah Mixed ..	16	80	—	20	30	—	93	Med. to late	,,
25 Gluyas ..	June 3	80	—	21	0	—	161	Early	Rust-proof
26. King's Early	2	80	—	13	3	—	100	,,	Rust-resistant
27. California Purp. Straw	2	80	—	9	13	—	71	Medium	Rust-affected
28. Early Purple Straw .	2	78	—	8	49	—	68	Med. to early	Rust-affected badly

The columns in the table showing the percentage comparison with the King's Early fixed at 100 per cent. afford the best means of looking at the yields from a common standard. The calculations were made from the plot of King's nearest adjacent and sown on a similar date. Where a plot occurs between two King's plots, the percentage comparison is made with the average of the two King's plots.

Thus, Plot 1 is compared with Plot 2; Plots 3-5, with the average of 2 and 6; Plots 7-11, with the average of 6 and 12; Plots 13-16, with the average of 12 and 17; Plots 19-24, with No. 18; and 25, 27, and 28, with No. 26.

While a careful examination of the yields will reveal faults with this method of comparison, taking the actual yields and these percentages together we can gain a fair idea of the relative behaviour of the several varieties grown under somewhat varying conditions.

The remarkably high percentages of the Gluyas easily place it at the top of grain producers. The comparatively high yield in Field No. 8 was due in part to a slight advantage it enjoyed by reason of better soil. The Fan, yielding 26 per cent. more grain than the adjoining King's, may be said to have grown on slightly better soil also.

The College Selection, a variety selected at the College, formerly known as Bearded Innominate, tops the list as a general sort, since it gave the highest comparative yield of hay, beating the nearest King's by 11 per cent. in hay and 9 per cent. in grain. The Dart's Imperial (also called Bluey),

nearest the Dart's and Leak's, the percentage, or relative yield, of the College Selection figures out a little the highest. However, in the hay yields there is little to choose among those showing a higher percentage than the King's.

Considering the high yield of the Majestic, and its practical immunity from rust, we must place it at the top as a hay variety. The rust-proof qualities of the Gluyas, resulting in a most perfect sample of grain, easily place that variety at the top in grain production.

The Medeah was really a general mixture of several varieties, with the Medeah predominating. The result, however, recommends the practice of mixing varieties for general crop, for this plot certainly had all the appearances of being as good in a general way as any in the entire list. The comparison yields of Plots 19-24 are slightly unfair, as the one plot of King's No. 18 was threshed with the threshing machine, while every other plot in the experiment was gathered with a complete harvester. There is every reason to believe that the threshing system saved a good percentage more grain than the harvester.

General Conclusions.

1. The Gluyas is the best yielding grain wheat, followed by Fan, College Selection, King's Early, and Majestic.
2. Considering quality as well as quantity, the Majestic tops the list as a hay variety, followed in order by College Selection, Dart's Imperial, Leak's Rustproof, and King's Early.
3. The College Selection is easily the best general variety.
4. These results must be taken simply as indicative and not as conclusive, for there is no reason to warrant anything like identical results on a different soil or in another season.

FERTILISER TESTS.

These experiments were also conducted in Field No. 6, on land which has been carefully cultivated and thoroughly manured for a number of years. We do not know the exact history of every plot, but it was assumed that the area was of fairly uniform quality, while the slight differences between the yields from the manured and the unmanured plots indicate that the land is still enjoying some of the benefits of former applications of manure.

Quantity of Manure Test.

This experiment occupied the extreme north end of the field. The sowing, both of grain and fertiliser, was done with the drill on May 25 and 26. The quantity of manure applied was carefully weighed, and agrees exactly with the figures given in the table. King's Early wheat was used throughout the experiment, and all the work in connection with the plots was made as uniform as possible. The plots ran east and west, being six passings of the drill in width, and about thirty chains long.

The land at the east end of the plots was fallowed early in the winter, while that of the west end was ploughed in midsummer. It was from the midsummer ploughing that the portion used for hay was selected. In harvesting broad borders were discarded at each end, and the plots were so divided that 0.54 acre was cut for hay and 1.50 acres were harvested for grain and straw. The cutting for grain was done a few days after the cutting for hay: all the plots were harvested at the same time. The unthreshed grain was run over the bridge, and careful weights recorded, as shown in the table below.

TABLE II.

Giving Yields per acre of Hay, Grain, and Straw from Fertiliser Test of quantity of Manure per acre.

Manure applied per Acre.	Yields per Acre.				Value of Crop per Acre.				Gain * or Loss † over No Manure Plots.		Cost of Super per Acre.	Gain * or Loss † after deducting Cost of Manure.	
	Harvested as Hay.	Harvested as Grain.			As Hay.	As Grain and Straw.							
		Unthr'shed Crop.	Wheat.	Saleable Straw.	£1/12/6 per ton.	Grain, 3s. per bushel.	Straw, 25s. per ton.	Total, Grain and Straw.	As Hay.	As Grain & Straw.		As Hay.	As Grain & Straw.
	lbs.	lbs.	bus. lbs	lbs.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
1. No Manure	3,373	3,417	17 17	1,435	2 8 11	2 11 10	0 16 0	3 7 10	—	—	—	—	—
2. 56 lbs. Mineral Super ..	3,850	3,920	19 5	1,646	2 15 7	2 19 5	0 18 5	3 17 10	*7 1	*12 8	2 2	*4 11	*10 6
3. 112 lbs. Mineral Super .	3,943	4,317	18 41	1,813	2 17 2	2 16 1	1 0 3	3 16 4	*8 8	*11 2	4 3	*4 7	* 6 11
4. 168 lbs. Mineral Super .	4,019	4,257	20 37	1,788	2 18 3	3 1 10	1 0 0	4 1 10	*9 9	*16 8	6 5	*3 4	*10 3
5. No Manure	3,302	3,447	15 25	1,448	2 8 0	2 6 3	0 16 2	3 2 5	—	—	—	—	—
6. 224 lbs. Mineral Super ..	3,443	3,373	13 40	1,417	2 9 11	2 1 0	0 15 10	2 16 10	*4 0	† 5 9	8 6	†4 6	†14 3
7. 280 lbs. Mineral Super .	3,396	3,440	15 9	1,445	2 9 3	2 5 11	0 16 2	3 2 1	*3 4	† 0 6	10 8	†7 4	†11 2
8. 336 lbs Mineral Super ..	3,840	4,187	20 43	1,759	2 15 9	3 2 2	0 19 8	4 1 10	*9 10	*19 3	12 9	†2 11	* 6 6
9. No Manure	3,019	2,967	9 35	1,246	2 3 9	1 8 9	0 13 11	2 2 8	—	—	—	—	—

The money value computations in the table of results was determined by taking the approximate values at the present time. Whatever the prices might be, the relative value of the yield from the various plots would be unchanged. The relative merits of hay or grain would depend so much on the ruling prices at the time that the figures below can be only suggestive. They may be interesting to indicate the relative products of the two systems of securing the crop.

The above figures offer one or two perplexing problems which defy solution. Plots 6 and 7, receiving 2 and 2½ cwt. of super respectively, have yielded less than Plot 5, on which no manure was applied. The only feasible explanation lies in the fact that the land was naturally well supplied with plant food, and that any further application of phosphates was unnecessary. Yet there may have been some condition due to the previous treatment of the land in Plots 6 and 7 which would cause these results.

The most that can be learned from the experiment is that the previous manurings have not tended to exhaust this field, but rather have imparted to it a very lasting benefit.

Turning to the figures column showing gross yields and net profits, we find the smaller applications giving the better yields of hay, and the application of 3 cwt. per acre has given the highest yield of grain.

In the profit and loss column we find ½ cwt. giving the greatest profit, followed by 1½ and 1 cwt. applications. In the larger applications there are less gains, and on the whole actual losses.

Comparing the returns for hay or grain with the prices adopted above there is a much better return from the latter. From our observation more grain and a better sample can be secured by cutting at the proper time and threshing the crop than from securing the crop with the stripper or harvester. There is some more work in this system, and it calls for a considerable outlay in machinery. Then, too, in all localities a price of 25s. per ton cannot be obtained for baled straw. Yet the system offers advantages which commend themselves to the careful consideration of those contemplating the extensive purchase of harvesting machinery.

While the results are somewhat unsatisfactory, they are indicative of the following conclusions:—

1. Continual and judicious manuring imparts to the land a lasting benefit.

2. Land naturally in a high state of fertility needs only a small quantity of soluble phosphate to induce a maximum yield.

3. With a market for the straw, and facilities for doing the work there is a decided advantage in favour of threshing the crop and baling the straw.

4. The percentage of straw in the unthreshed crop is about 42. The remaining 58 per cent. goes to the wheat and chaff.

PHOSPHATE TEST.

This experiment did not have for its object the testing of brands of phosphates, but rather the trial of the various kinds of manures. For the purposes of the experiment it is unnecessary to consider the name or maker of the manure, but to look more to the source and character of material.

The wheat manure used on Plot 2 differs from the ordinary phosphate in that it contains a small percentage of nitrogen and potash. The analysis of the article used was approximately as follows:—Water-soluble phosphate, 25 per cent.; citrate soluble, 10 per cent.; acid soluble, 5 per cent.; total, 40 per cent.; nitrogen, 1 per cent.; also potash; cost, £5 per ton.

The home mixed manure is, like the wheat manure, a complete fertiliser, made up of one part each of nitrate of soda and muriate of potash to two parts of mineral super. This gives a manure very rich comparatively in nitrogen and potash, the mixture containing approximately 4 per cent nitrogen 15 per cent. potash, and 18-19 per cent. water-soluble phosphate. The cost owing to the high price of the nitrogen and potash, renders this mixture too expensive, as the price would figure out to £8 per ton.

Mineral super is one of the commercial phosphates sold under a guarantee of 36-38 per cent. water-soluble phosphate and 6-8 per cent. citrate soluble; price, £4 5s. per ton. This manure differs from the two former in the fact

TABLE III.

Showing Results from Applications of various Manures.

Manures, 2 cwt. per Acre.	Yields per Acre.					Value of Crop per Acre.				Average Gain over No Manure Plots.		Cost of Fertiliser per Acre.	Gain * or Loss † over Cost of Manure.	
	Harvested as Hay.	Harvested as Grain.				Hay.	As Grain and Straw.							
		Unthr'shed Crop.	Grain.		Straw.	£1/12/6 per ton.	Grain, 3s. per bushel.	Straw, 25s. per ton.	Total Grain and Straw.	Hay.	Grain and Straw.		As Hay.	As Grain and Straw.
	lbs.	lbs.	bus.	lbs.	lbs.	£ s. d.	£ s. d.	s. d.	£ s. d.	s. d.	£ s. d.	s. d.	s. d.	s. d.
1. No Manure ..	3,019	2,967	9	35	1,219	2 3 9	1 8 9	13 7	2 2 4	—	—	—	—	—
2. Wheat Manure ..	2,964	3,390	18	5	1,424	2 3 0	2 14 3	15 10	3 10 1	0 3	1 5 5	10 0	† 9 9	*15 5
3. Home Mixture ..	3,198	3,940	18	36	1,655	2 6 5	2 15 9	18 6	3 14 3	3 8	1 9 7	16 0	†12 4	*13 7
4. Mineral Super ..	3,075	3,923	18	1	1,648	2 4 7	2 14 0	18 5	3 12 5	1 10	1 7 9	8 6	† 6 8	*19 3
5. No Manure ..	2,877	2,913	11	3	1,223	2 1 8	1 13 2	13 9	2 6 11	—	—	—	—	—
6. Guano Super ..	3,567	4,080	18	7	1,713	2 11 9	2 14 4	19 6	3 13 10	10 9	1 5 5	8 3	* 2 6	*17 2
7. Bone Dust ..	3,472	3,497	14	32	1,469	2 10 4	2 3 7	16 5	3 0 0	8 3	0 11 7	11 6	† 3 3	* 0 1
8. Thomas Phosphate	3,424	3,220	11	41	1,353	2 9 8	1 15 6	15 1	2 10 7	7 7	0 2 2	8 0	† 0 5	† 5 10
9. No Manure ..	2,773	2,877	12	8	1,208	2 0 3	1 16 5	13 6	2 9 11	—	—	—	—	—

that it contains absolutely no nitrogen nor potash, but more soluble phosphate than either of the above.

Bonedust is an animal phosphate in its natural state; that is, the phosphoric acid has not been treated to affect its solubility. It contains more phosphoric acid than the mineral super, yet in a less available form. It contains also a good percentage of nitrogen, the analysis being:—Acid-soluble phosphate, 45 per cent.; nitrogen, 3.14 per cent.; price, £5 15s. per ton.

Guano super resembles more closely the wheat manure than any other of the above, containing less soluble and less total phosphate, with a very small percentage of nitrogen and potash, but not specified. The super bears a guarantee of water-soluble, 20.30 per cent.; citrate- and acid-soluble, 16.20 per cent.; price, £4 2s. 6d.

Thomas phosphate is a waste product, obtained by precipitating with lime the phosphoric acid in certain iron ores. It is one of the most difficult phosphates to dissolve, containing 30 per cent. calcium phosphate, all in the acid-soluble form. The price is £4 per ton.

The quantity applied per acre was in all cases 2 cwt., and the King's Early wheat was sown throughout the experiment. The seed and fertilisers were sown with the drill on May 26 and 27. The gain or loss over the average of the no manure plots was determined by comparing the results with the two unmanured plots nearest adjacent.

The natural high state of fertility of this land, as in the former experiment, has again asserted itself, especially on the portion of the plot harvested as hay. In the grain yields there is a decided increased crop where the soluble phosphates were applied in Plots 2, 3, 4, and 6.

The unequal relative yield of grain to the unthreshed crop is a condition not easy to explain. The straw averaged about 42 per cent. of the weight of the crop as it came from the field.

In the total yield of grain the home mixture tops the list, although its excessive cost brings its margin of net gain down in the last column. The experiment is one calling for several trials before definite conclusions can be drawn. The variations in the soil and the seasons must be considered, and this cannot be done in one year. It is quite evident, as in the previous experiment, that in this soil the smaller applications would have realised larger financial gains.

On the whole, the fertiliser tests have given us only partial conclusions. They indicate, however, that there is no danger in ruining the land by the application of commercial manures, for the field on which these experiments were tried has perhaps been manured with phosphates as much as any farming land in the State.

Another conclusion that may be safely drawn is that land in good heart can be brought to its most profitable yield through the moderate application of soluble phosphates rather than by heavy dressings. The results give little, but not much, encouragement in the use of nitrogenous manures.

ROSEWORTHY AGRICULTURAL COLLEGE NOTES.

FARM.

By J. D. Towar, Principal Agricultural College.

Work during the past month has consisted in cleaning up after the harvest and getting the fallows again in proper condition. The great quantity of rain which came during December induced a vigorous growth of weeds, and these have kept the scarifiers busy for a whole month. The job is now nearly completed, and where the work was begun promptly the soil beneath the surface is abundantly moist, but that portion of the fallow which had to be left until the last has become quite dry through the extensive surface evaporation and the great draught made on its water supply by the growth of weeds.

Feed is abundant, and the stock is all in excellent condition. Two or three hundred more sheep could be kept than we now have, but prices for stores have prevented our purchasing of more stock. The College Farm has recently received, the gift of the Hon. J. J. Duncan, a fine young Berkshire boar and sow, products of his Gum Creek Station. We are fattening, mostly on barley, about fifty young pigs. Sales of breeding stock have been very brisk; in fact, we are practically sold out of everything old enough to wean.

The cows have been receiving our second cutting of lucerne. the first crop having been put in the silo. To our surprise, the cows did not take kindly to the green lucerne. They show a decided preference for silage which has lain in the pit for more than a year.

The College vegetable garden has been a great satisfaction this summer. The copious summer rains, supplemented by the irrigation of Barossa water, has kept us with a constant supply of green vegetables. With the aid of the water the lawn and flower beds at the College buildings and cottages have been kept growing and healthy. A large area has been planted to couch grass and flowers, while several rows of hedge are starting to protect the gardens from the winds, which now are our worst hindrance.

EXPERIMENTAL VINEYARD.

By H. E. Laffer, Superintendent of Vineyard.

The grapes are now ripening rapidly, and vintage should start about the third or fourth week in February. Though the crop is by no means heavy, the fruit is large and well filled, consequently the weight of grapes will be heavy. All being well, we should make over four thousand gallons of wine this year.

Owing to the heavy summer rains the vines are making abundant growth, the result of which should appear in the crop of next year. The total rainfall for 1903 was 18.33 inches, and of this amount over four inches fell during the last five weeks of the year. The rains rendered constant scarifying necessary, and the teams have been busy all the time. Weeds have been very plentiful, one crop following another.

The currants responded to the ringbarking, and are carrying an abundant crop of fine fruit. These will shortly be ready for drying, and should yield more than enough currants to supply the College for the year.

Birds, as usual, are proving a great nuisance, the starlings being present in large numbers. We have erected a number of bird-scarers, with the hope of protecting the fruit a little.

The young fruit trees planted last season have been given a good soaking of water for the first time, the summer rains having kept them going up to the present. The nursery stock looks well and is ready for budding, which will be done within the next few days.

DEPARTMENTAL NOTES AND WORK.

The South Australian Government has been advised that a proclamation has been issued by the Government of Natal ordering the removal of the prohibition that had been imposed against the importation of cattle from Australia. Cattle will now be allowed to land at Natal ports on certain conditions. The person or persons in charge of a herd must produce a certificate signed by a professional officer attached to the Veterinary Department of the State where the cattle were shipped, stating that the animals in question are free from pleuro-pneumonia, and have been inoculated against that disease three months prior to embarkation. It is also provided that the cattle shall be dipped to the satisfaction of the Natal authorities as soon as possible after they are landed, and that all cattle other than those intended for slaughter shall be quarantined at the owners' expense, and to the satisfaction of the principal veterinary surgeon, for such time (not being less than one month) and at such place as the officer in question may direct.

The Secretary for Agriculture has received from the Secretary to the Board of Commissioners of Agriculture and Forestry at Honolulu a couple of pamphlets embodying the restrictions placed upon plants and fruits which may be brought to the port of Honolulu for introduction to the territory of Hawaii. Under these the following items are of interest to Australians:— All coffee and pineapple plants are prohibited, and fruits of all kinds from Australia. The only port of entry by which plants may be introduced to the territory is Honolulu. All plants, etc., on arrival at Honolulu are to be inspected by an inspector, who may fumigate and admit them to the country or destroy the same, at discretion. All plants, etc., sent to Honolulu must bear a label which sets out the name, quantity, and description of the articles. The names of the locality where they are grown, of the shipper, and the port whence they were shipped, as well as that of the consignee in Hawaii, must all be supplied upon the label.

The Queensland Department of Agriculture has forwarded copies of regulations dealing with the introduction of grape cuttings into that State from South Australia. The regulations provide that such cuttings shall be consigned to the Department of Agriculture, Brisbane; that a certificate from the Department of Agriculture in South Australia stating that the cuttings originated from that State, and that the vineyard whence they were taken was free from disease, shall accompany such cuttings; that the cuttings shall not be rooted or root-bearing; that the cuttings, on arrival at Brisbane, shall be subjected to inspection and such disinfection or other treatment as the Minister may direct.

During the month the Inspector of Fertilisers visited Port Pirie, Port Adelaide, and the bonemills and manure works in the vicinity of Adelaide, for the purpose of securing for analyses samples of the various fertilisers offered for sale. During the past two months twenty-two samples have been taken by the Inspector. Mr. Summers also arranged while at Port Pirie for the carrying out of experiments in the treatment of land infested by ice plant. At Coromandel Valley he is supervising experiments with various solutions being used in the endeavour to destroy the perennial weed, Hypericum perforatum, illustrated in the January issue of *The Journal of Agriculture.*

Mr. G. S. Thomson has resigned his connection with this Department to accept an offer from the Queensland Department of Agriculture. Mr. Thomson was appointed by Sir J. A. Cockburn (who was then Minister of Agriculture) as Dairy Instructor, and during his service in South Australia has done much to improve the status of the dairying industry. Mr Thomson's resignation will be greatly regretted by all those with whom he has come in contact, and the people of Queensland may be congratulated on securing the services of such an able officer. We are sure the members of the Agricultural Bureau will join with officers of the Department in wishing Mr. Thomson every success in his new sphere of work.

On January 14 Mr. Quinn visited the Clare district, at the invitation of the local Agricultural Bureau, and gave a demonstration and field lecture on summer pruning apple, pear, and peach trees, in the orchard of Messrs. Birks Brothers, at Spring Farm. About a dozen growers attended, and showed keen interest in the operations. It was explained that had the matter been made public a great many others not connected with the Bureau would have attended. On January 21 a similar demonstration was given in connection with the Agricultural Bureau Branches of Mount Compass and Willunga, in the orchard of Mr. Felix De Caux, on the Meadows road. About twenty persons attended from the neighbourhood, where much interest is being taken in the growing of apples for export.

During January the Inspectors under the Vine, Fruit, and Vegetable Protection Act have passed for interstate export 7,756 bushels of fruits, consisting of 16 distinct sorts, 3,155 packages of vegetables, and 14 consignments of plants. During the same period 3,490 bushels of tropical fruits, with 59 consignments of plants, have been admitted to this State, while 226 bushels of bananas and 7 packages of plants have been refused admission owing to their condition not complying with the requirements of the above Act.

During the next two months the Annual Conferences of the Agricultural Bureau will be held in the various districts. These annual gatherings should be very instructive to members and to producers generally, and it rests entirely with the members of the Branches whether the desired results will be achieved. We would strongly appeal to the members of the Bureau to do all in their power to assist the Branches which are arranging the Conferences. The appointment of delegates should receive early attention, and each Branch within reasonable distance should be represented. The work in connection with these Conferences falls mainly upon the Hon. Secretaries of the respective Branches in charge of the arrangements, and it is very disheartening to them if, after all their labours, the Conference fails to reach expectations, owing to the apathy of those upon whom they are depending for assistance.

The Conference of Northern Branches of the Agricultural Bureau will be held at Gladstone on February 10; Murray River Conference, at Mannum, on February 24-5; Northern Yorke's Peninsula Conference, at Paskeville, on February 26; Southern Conference, at Strathalbyn, on March 21 (?); South Eastern Conference, at Bordertown, on April 6.

DATES OF MEETINGS OF BRANCHES OF THE AGRICULTURAL BUREAU.

With a view of publishing in the "Journal" the dates of meetings of the branches of the Agricultural Bureau, Hon. Secretaries are requested to forward dates of their next meetings in time for publication.

Branch.	Date of Meeting.		Branch	Date of Meeting.	
Balaklava	Feb. 13	Mar. 12	Mallala	Feb. 1	Mar. 7
Booleroo Centre	2	1	Mannum	20	19
Bowhill	6	5	Minlaton	20	19
Brinkworth	5	4	Mount Compass	13	—
Burra	12	11	Nantawarra	-	2 & 30
Cherry Gardens	9	8	Naracoorte	13	12
Clare	26	25	Norton's Summit	26	25
Clarendon	8	—	Onetree Hill	25	31
Colton	6	5	Penola	13	12
Crystal Brook	6	—	Pine Forest	2	1
Elbow Hill	2	1	Port Broughton	25	31
Finniss	1	7	Port Elliot	20	19
Forest Range	25	31	Port Lincoln	19	18
Gawler River	26	25	Pyap	3	2
Golden Grove	—	3 & 31	Reeves Plains	—	11
Hartley	26	—	Riverton	27	26
Inkerman	2	1	Stansbury	6	5
Johnsburg	27	26	Strathalbyn	16	15
Kanmantoo	26	25	Utera Plains	27	26
Kapunda	6	5	Virginia	1 & 29	28
Kingscote	8	14	Wandearah	1 & 29	28
Kingston	6	5	Whyte-Yarcowie	20	19
Koolunga	25	31	Willunga	6	5
Longwood	27	—	Wilmington	—	2 & 30
Maitland	6	5			

FARM AND DAIRY PRODUCE MARKETS REVIEW.

Messrs. A. W. Sandford & Co. report on February 1, 1904:—

Throughout January most unusual broken weather was experienced, and at times so unsettled that quantities of wheat stacked in the fields became bleached through the unseasonable rains. Even in the interior phenomenal downpours have been recorded, some districts reporting floods; but, fortunately, the pleasing feature is the heaviest rains occurred in parts that had suffered most severely during the drought seasons. Meanwhile farmers taking advantage of the finer days have about completed harvesting operations, and although values are not all that could be desired, and the quality of the wheat not by any means improved by the rains, the extra yield more than compensates for any of these losses. With pastoralists the return again to favourable conditions—feed and water being in such full supply—has already induced them to restock stations that had been abandoned for years.

As usual, during first week or so of the new year, there was the customary absence of anything approaching briskness in trade, therefore shopkeepers in the city and towns complained bitterly of the exceptional dulness, which they partly attributed to the unseasonable weather; but as the holidays were left behind trade settled down to its normal state, and, as the prospects throughout are promising, a hopeful spirit in the mercantile community prevails.

In the Share Market, after an absence of dividends for several months, the Broken Hill Silver Company has declared one, and, as the prospects seem very assuring—ore in sight, abundance of water, etc.—it is expected that these dividends are likely now to be more frequent. In Metals, Copper has gone back almost a couple of pounds per ton, whilst Silver and Lead are also easier.

Breadstuffs.—The firmness in the European Market, reported in our last, did not continue long, owing to Argentine coming forward freely, offering the product of an immense harvest at reduced rates, and as there was no prospect of an immediate rupture between Japan and Russia values declined and there are sellers of Australian cargo at 29/, 28/9 being the highest now offering for February shipment. Freights to U.K., on the other hand, have advanced, and 23/6 is now the lowest, at which large parcels are obtainable. This has caused a strong reaction in the value of Wheat, so that the quotations in the eastern States have all receded. In both Melbourne and Sydney, from which supplies of Wheat are coming to the shipping ports, there is every probability that a block will very shortly occur. In South Australia, where our farmers in this direction are better off, deliveries have not been so rushed, but quite enough is coming forward to load vessels as they arrive. Flour.—A fair amount of business in this line has been done during the month, bakers entering rather freely into contracts for the year whilst the war scare was on. At the moment, however, a dulness prevails. In Offal, there has been a considerable demand for Bran and Pollard. Millers having refused to enter into contracts, dealers in the meanwhile have been buying and storing for their future requirements. Trade in Fodder, as expected, has been of a very hand-to-mouth character, there being quite an absence of any export in Chaff owing to each of the States of the Commonwealth having ample supplies, so that aboard quotations are only nominal. The local demand is also restricted to city sales. In Feeding Grains the same applies, there being very few sales to report, both growers and buyers holding off the market. Barley.—Maltsters have been operating pretty freely, but very little quotable alteration in values to report. Cape Barley has also received better attention.

Potatoes.—The new season's crop raised on the plains near to Adelaide has been quite ample for all this State's requirements during January; but, as the first of the early grown "Gambiers" are now being offered, even the exceptionally low price of the "Locals" has had to further give way, so as to effect quittances. On the other hand, growers of earlier raised "Gambiers" are offering at a figure that is already causing a demand from Western Australia, with several small parcels having been disposed of for that market Onions, also raised on the plains, have met with a dull month's trade, although quoted at extremely low rates for the time of year.

There has been little, if any, shrinkage in the quantities of Dairy Products marketed, several of the lines continuing to be in excess of South Australian demands; but as our neighbours in Broken Hill and Western Australia are operating here, good clearances have been effected, excepting in

Butter, the market for which is anything but satisfactory, this owing to the heavy losses already incurred in shipments consigned to London, account sales for which are now coming to hand; but, as stocks of bulk are again accumulating, a couple of further parcels are likely to be forwarded so as to effect a quittance. Eggs.—It is generally considered safe to predict a slump in values once the holidays are touched, but the unexpected has been most pronounced this season, as the heavy export orders have kept the produce marts so well cleared that the market shows an advance of a penny farthing per dozen. Cheese.—As many of the factories prefer putting their milk into Cheese rather than accept butter values, the rates ruling now are lower than for years back. However, with summer weather on, consumption is fairly heavy. Bacon.—The number of hogs raised in South Australia is steadily

put through has been very satisfactory. Hams continue to be in good request, but, as usual, the difficulty is to secure the lighter weights. Almonds are neglected. Honey.—The yield this season has been almost a failure, resulting in values being firm, and already several importations have been brought along from the eastern States.

Live Poultry has commanded extra attention amongst the buyers, and although the penning at several of the sales was fairly extensive, prices kept well up under the influence of keen competition.

MARKET QUOTATIONS OF THE DAY.

WHEAT.—At Port Adelaide, shipping parcels, new, 2/9½ per bushel 60 lb.

FLOUR.—City brands, £7 10/ to £7 15/; country, £7 to £7 5/.

BRAN.—6¾d.; **POLLARD**, 8d. per bushel of 20 lb.

OATS.—Local Algerian and Dun, 1/ to 1/3; White Champions, 1/4 to 1/6 per bushel 40 lb.

BARLEY.—Malting, 2/10 to 3/2; Cape, 1/6 to 1/8 per bushel 50 lb.

CHAFF.—£2 10/- per ton of 2,240 lb., bags in, f.o.b. Port Adelaide.

POTATOES.—New locals, £2 5/- to £2 10/- per 2,240 lb.; Gambiers, £2 15/- per 2,240 lb. f.o.b. Port Adelaide.

ONIONS.—New locals, £2 to £3 per 2,240 lb.

BUTTER.—Creamery and factory prints, 8d. to 10d.; prime separator and choice dairy, 7½d. to 9d.; well-graded collectors' and fair dairy, 6d. to 7d.; medium stores, 5d. to 5½d.; pastry or creamy lots, 4d. to 4½d.

CHEESE.—New season's make, 4½d. to 6d. per lb.

BACON.—Factory cured sides, 7½d. to 8d.; farm flitches, 6d. to 7d. per lb

HAMS.—S.A. factory, 10d. per lb.

EGGS.—Loose, 10d.; in casks, f.o.b., 11½d. per dozen.

LARD.—In bladders, 6d.; tins, 5d. to 5½d. per lb.

HONEY.—3d. for best extracted, in 60-lb. tins; **BEESWAX**, 1/2 per lb

ALMONDS.—Fine softshells, 4½d. to 5d.; kernels, 9½d. per lb.

LIVE POULTRY.—Heavy weight table roosters realised 2/2 to 2/9 each; good hens and fair-conditioned cockerels, 1/5 to 1/10; chicks to light birds, from 9d. to 1/4; ducks, 1/11 to 2/9 for prime; geese, 3/6 to 4/6; pigeons, 6d.; turkeys, from 8½d. to 9¾d. per lb., live weight, for fair to good table sorts.

Above quotations, unless when otherwise specified, are duty paid values on imported lines. Grain, Flour, and Forage for export are f.o.b. prices at Port Adelaide. Dairy products are City Auction Mart rates. In Grain, Chaff and Potatoes sacks are included, but weighed as produce. Packages free with bulk Butter and Cheese.

MONTHLY RAINFALL.

The following table shows the rainfall for the month of January, 1904:—

Adelaide	2·53	Manoora	1·87	Echunga	4·06
Hawker	0·70	Hoyleton	2 03	Macclesfield	3·31
Cradock	0·35	Balaklava	1·54	Meadows	4·65
Wilson	0·41	Port Wakefield	1·43	Strathalbyn	2·23
Gordon	0·38	Saddleworth	1·91	Callington	2·25
Quorn	1·02	Marrabel	1·77	Langhorne's Bridge	1·62
Port Augusta	1·17	Riverton	2·33	Milang	1·56
Port Germein	2·25	Tarlee	2·39	Wallaroo	1·67
Port Pirie	2·28	Stockport	2·25	Kadina	1·60
Crystal Brook	2·12	Hamley Bridge	1·87	Moonta	2·34
Port Broughton	1·25	Kapunda	1·81	Green's Plains	1·76
Bute	1·36	Freeling	2·13	Maitland	2·15
Hammond	1·31	Stockwell	1·57	Ardrossan	1·76
Bruce	0·93	Nuriootpa	2·29	Port Victoria	1·36
Wilmington	1·37	Angaston	1·80	Curramulka	1·37
Melrose	1·97	Tanunda	2·11	Minlaton	1·61
Booleroo Centre	2·40	Lyndoch	2·38	Stansbury	1·62
Wirrabara	1·60	Mallala	1·76	Warooka	1·34
Appila	1·68	Roseworthy	1·91	Yorketown	1·22
Laura	2·92	Gawler	2·31	Edithburg	1·86
Caltowie	2·08	Smithfield	2·05	Fowler's Bay	0·04
Jamestown	1·67	Two Wells	1·68	Streaky Bay	0·48
Gladstone	2·60	Virginia	1·73	Port Elliston	0·55
Georgetown	2·01	Salisbury	3·10	Port Lincoln	0·95
Narridy	1·63	Tea Tree Gully	3·51	Cowell	0·92
Redhill	2·12	Magill	3·22	Queenscliffe	1·77
Koolunga	1·52	Mitcham	2·62	Port Elliot	1·97
Carrieton	1·60	Crafers	5·33	Goolwa	2·10
Eurelia	1·37	Clarendon	6·24	Meningie	1·81
Johnsburg	1·12	Morphett Vale	3·11	Kingston	2·95
Orroroo	1·17	Noarlunga	2·12	Robe	2·16
Black Rock	0·57	Willunga	2·82	Beachport	4·05
Petersburg	1·12	Aldinga	2·13	Coonalpyn	1·38
Yongala	1·35	Normanville	1·88	Bordertown	1·54
Terowie	1·00	Yankalilla	0·95	Frances	0·79
Yarcowie	1·19	Eudunda	1·43	Naracoorte	1·32
Hallett	1·44	Truro	1·40	Lucindale	1·50
Mt. Bryan	1·29	Palmer	1·33	Penola	2·86
Burra	1·25	Mount Pleasant	2·42	Millicent	2·49
Snowtown	1·46	Blumberg	3·14	Mount Gambier	3·85
Brinkworth	1·50	Gumeracha	3·85	Wellington	1·99
Blyth	1·41	Lobethal	3·47	Murray Bridge	1·74
Clare	1·85	Woodside	3·95	Mannum	0·92
Mintaro Central	1·64	Hahndorf	3·55	Morgan	0·25
Watervale	1·77	Nairne	2·89	Overland Corner	0·50
Auburn	1·82	Mount Barker	4·01	Renmark	0·50

AGRICULTURAL BUREAU REPORTS.

Hartley, December 4.

PRESENT—Messrs. W. Brook (chair) C. Brook, Klenke, Kutzer, Pratt, Reimers, Wundersitz, Hassam, Jaensch, and Fry (Hon. Sec.).

HORSEBREEDING.—Considerable discussion took place on the best kind of horse to breed for profit, and a motion was carried favouring the active, but heavy, draught, in preference to a thick-set, medium draught.

Kingston, December 5.

PRESENT—Messrs. T. Redman (chair), McBain, Fraser, Clarke, Wight, McCulloch, Barnett, and V. Redman (Hon. Sec.).

THE BRANDS ACTS.—Mr. T. Redman read a paper on this subject. Branding of stock was early recognised to be necessary, not only as a protection against unscrupulous persons taking possession of stock that did not belong to them, but the brand of good breeders gave to their animals an added market value. Thirty years ago there was much dissatisfaction amongst owners owing to several using the same or very similar brands, with the result that large breeders were often unable to recover stolen stock even when they had good reasons for believing that they were in the possession of certain persons. These causes led to the passing of the Brands Act of 1878, and, in his opinion, this Act gave to stockowners the very best protection against stock thieves. In this Act it was provided that persons in charge of travelling stock must possess a waybill or delivery note from the owner or his representative, in which the stock and their brands were accurately described. The drover was bound to show this waybill to any overseer of runs, Magistrate, or police officer, when called upon to do so, and in the event of the stock not being as described on the waybill they could be impounded, and the person in charge was liable to a heavy penalty. The following year, as a result of a hue and cry from stockowners who were rarely out of sight of Adelaide, these clauses were repealed. The Act of 1879 and 1882 give good protection to owners as regards branding, tracing lost stock through pounds, etc., but none of the clauses give adequate protection against theft. Clauses 26 and 27 of the 1878 Act should be re-enacted in a somewhat modified form. To have a mob of sheep or cattle or horses properly waybilled could surely entail no hardship on the owner or drover. Similar precautions were insisted on in almost all other matters of trade where the risk was not so great and the value of the goods much less. In respect to sheep the most valuable means of identification was the earmark; but, unfortunately, there was no law for the registration of earmarks, the paint brands on the wool being the only ones registered. Provision was, however, made for tattoo brands on sheep, but so far as he knew this method had not been adopted to any extent. He considered that proper registration of earmarks was much preferable to the present system of branding of wool which is removed annually. The loss occasioned through the branding of cattle on the most valuable portions of the hide was referred to. In branding, it was, of course, necessary that the brand should be legible, but this should not be done in such a way as to unnecessarily torture the beast or to cause loss in value of the hide. To impress a firebrand so that it remains sufficiently legible was, in his opinion, not very painful: but, to let the hot iron slip several inches along the skin or to burn quite through the skin, as was the case sometimes, was monstrously cruel, and he condemned such careless or thoughtless cruelty in unmeasured terms.

Finniss, January 4.

PRESENT—Messrs. Chibnall (chair), Collett, and Henley (Hon. Sec.).

RUST-RESISTING WHEATS.—Considerable discussion on this subject took place, Marshall's No. 3 wheat being strongly recommended as a good all-round wheat. Majestic is liable to be blighted when coming into ear, and for grain is not altogether a success, the proportion of straw to grain being far too high.

Kingscote, December 14.

Present—Messrs. Turner (chair), Olds, Carter, Wright, C. J. and P. T. Bell, Neave, and Cook (Hon. Sec.).

Smut in Grass.—Mr. P. T. Bell tabled specimen of a species of Brome grass badly affected by a smut similar in appearance to the common smut of wheat. He gathered the grass in his barley crop, but the barley, the seed of which had not been pickled, was quite clean. [A number of our grasses are subject to attack by fungi closely allied to the common cereal smuts, and sometimes considerable patches will be found badly affected.—Ed.] Some discussion on pickling ensued. Most of the members had pickled with ordinary sea water, and got clean crops; but the Chairman had often seen smut in crops grown from seed pickled in this way.

Mount Gambler, December 12.

Present—Messrs. Dyke (chair), Watson, Ruwoldt, Wedd, Barrows, Edwards, Mitchell, Wilson, Norman, and Lewis (Hon. Sec.).

Red Rust.—Mr. Ruwoldt tabled samples of Newmarket Oats and Dart's Imperial and Marshall's No. 3 wheats. Of the wheats Dart's Imperial, which proved a very heavy yielder with him, was badly affected by rust. Mr. Mitchell reported only a little rust on the flag in his Marshall's No. 3 wheat at Glencoe. Members generally reported severe damage by rust in the crops. Some King's Early wheat was badly affected.

Dairy Cattle.—Paper by Mr. Thomson in November issue of *Journal of Agriculture* was discussed. The Chairman stated that he was formerly a strong supporter of the pure-bred Jersey, but he found that owing to the small carcase he lost by them, and had tried the Shorthorn-Jersey cross, with which he was very well pleased. Most of the members favoured this cross in preference to the pure bred, finding that the cows gave quite as much milk and made good profitable beasts for the butcher. One or two members spoke highly of the Shorthorn-Ayrshire cross, and it was finally resolved that this Branch affirms Mr. Thomson's contention that the crossbred cow was most profitable to the dairyman, the Jersey-Shorthorn being the strain best suited to this district. Members also expressed the opinion that the teaching of a few students at Roseworthy should not be allowed to interfere with Mr. Thomson's duties as Dairy Instructor to the State.

Selling Grain.—A short discussion took place in reference to the disposal of the grain crops and the system of paying for the bags as wheat.

Watervale, December 28.

Present -Messrs. Treloar (chair), Holder, Ashton, Perrin, Scovell, Ward, Smith, Solly, and Castine (Hon. Sec.).

Orchard Cultivation and the Treatment of Codlin Moth.—Mr. G. Holder read a paper on this subject. The ground should be well ploughed at the proper time, and not when wet or boggy. He thought too much work was done in the vineyards in the wet weather. For destroying weeds one day's harrowing in dry weather was worth a week's work when the ground is wet He failed to see the need for heavy implements. If a one-horse implement will do the work as well, why use something heavier requiring two horses? Although he had a scarifier he never used it in his orchard or vineyard, as the scarifier-harrows were lighter and did splendid work in destroying weeds. Handles should be fixed to them to keep them firm in the ground and to more easily control them when working near trees or vines. This year it had been very difficult to keep down the weeds, but he had got the garden fairly clean. It was ploughed and harrowed and gone over twice since with the scarifier-harrows. In dealing with the codlin moth he strongly advised them to keep the stems and large limbs clean of old rough bark, and to whitewash them in winter, using good lime. Removing all the other possible harbours for the caterpillars will drive more of them to the bandages, which should be attended to regularly. All fallen fruit should be gathered and taken direct to a copper and boiled. This fruit can be fed to pigs or poultry, and so give the grower some recompense for his labour. Then, with careful spraying in addition, he was sure that they could deal effectively with the codlin moth.

Clarendon, December 14.

Present—Messrs. Juers (chair), A. and A. A. Harper, Phelps, Payne, Pelling, Morphett, Piggott, Dunmill, Spencer, Brooks, and Wright (Hon. Sec.), and one visitor.

Bot Fly.—Mr. A. A. Harper tabled specimen of bot fly, and advised members to attend to their horses. Regular grooming and rubbing under the jaw and near the shoulders with a cloth damped with kerosine or carbolic would prevent trouble.

Exhibits.—Mr. A. A. Harper tabled very good sample of linseed grown by himself. Mr. Pelling tabled potato, which was identified by members as Vermont. It was a good sample.

Dairy Cattle.—A long discussion took place on Mr. Thomson's article in November issue of *The Journal of Agriculture*, and it was unanimously resolved that for this district the Shorthorn-Jersey stock were most profitable.

Naracoorte, December 12.

Present—Messrs. Forster (chair), Wardle, Attiwill, McLeay, Caldwell, Coe, and Duffield.

Dipping Sheep.—The local Stock Inspector advised that dipping sheep after shearing was only compulsory on owners of tick-infested sheep, and any failure to dip rendered the owners liable to prosecution. He strongly recommended the use of good, standard, poisonous dips; carbolic and tar dips were almost useless

Wheat Prizes at Adelaide Show.—Discussion on this subject took place, the conditions of the competition generally being considered as onerous on competitors, especially the clause requiring the exhibitors to keep on hand fifty bags equal to the sample exhibited. The question of the difficulty in wheat grown in the South-East competing with northern-grown wheat was also mentioned.

Prevention of Fire.—Mr. J. G. Forster read a paper on the prevention and management of bush fires. To guard against fires it is a good plan to plough a few furrows from ten feet to half a chain apart around boundaries and across the paddocks if the holding is large. Especial protection should be given to homesteads and stacks. Then in calm weather or evenings burn between the furrows where no natural brake exists, such as beaten roads, watercourses, or swamps; and only allow safety matches to be used on the property. Don't encourage the sale of any other kind of strike-a-light, as wax vestas and tandstickors will make fire in the sun. Do not lay out phosphorised baits for rabbits if the thermometer registers over 90 degrees in the shade, and whenever doing so always be sure the bait lodges in the furrow. If a person tells you he can mix phosphorus without danger of igniting if freshly laid out in a temperature of 140 deg. Fahr. in the sun, do not believe him, as he is a stranger to the truth. Sufficient care is not often taken of camp fires during the summer, and all persons would do well to examine any camp fires that come in their way, especially in the morning, as the least spark left will start a fire if the wind rises. Glass amongst dry grass will start a fire if exposed to the sun on a hot day. Now he came to the question of how to deal with a fire when started. First, open country:—It is always well to have something in readiness, such as beaters, water kegs, and casks that will hold water, and syringes. A plough, harness, and horses are always at hand on farms and stations. A good kind of firebeater is a piece of cow hide, bell shaped, 18 to 24 inches across, tapered, and rivetted to broom or fork handles, kept supple, or laid in water during summer. When a fire is seen by a person interested, his first consideration should be—Where is the fire, and what direction and strength is the wind; what hour of the day, and what kind of country is ahead of the fire? The strength of the wind and the hour of the day are two vital considerations. If there is little or no wind a fire can be easily managed. It is those strong, hot winds which require the calm thought, and when the time of day must be considered. A fire starting with a strong, hot, north wind from 10 to 12 o'clock in the morning will travel the direction of the wind at that time until 2 to 3 o'clock in the afternoon at the earliest. Then one requires to know what kind of country is ahead. If high grass and no wide breaks it would be little use attempting to stop the head of the fire, and all strength with ploughs, beaters, etc., should be brought to bear on the quarters, driving the fire into as narrow a strip as possible until some break can be made ahead. At all times keep in mind the hour of the day [illegible] and [illegible] east [illegible] fire. Calm management of workers at a fire is required by some person who has experience of such, otherwise men will be working often to no good, all concentrated in some spot of no consequence, while a critical point is left unguarded, and all previous work wasted. Men should be worked in relays—half beating and half resting—as no work is more exhausting than fire beating on a hot day. By all means keep plenty of water or some beverage at hand. In burning a brake at a time a fire is raging be sure and start it far enough in advance of the main fire to allow time to burn back some distance, as should the main and brake fires meet before a wide space is burnt, the chances are that the flames will leap over the brake and receive fresh energy. In case any sheep are likely to be caught in the course of a fire, before the main fire gets near light a fire under their bellies, when the fire will creep through the flock with little or no damage to the sheep; whereas a fire coming in full, raging force would roast them. The same would apply to horses and cattle, but they can generally be moved when sheep cannot. When the fire has passed run around the fence with a cask of water and a syringe, when all posts can be saved if caught in time In timbered country, whenever a fire is checked it will be necessary to move all logs into the burnt ground some distance (50 ft. or over), or burn around anything not movable, such as dry trees, or trees partly dry, and heavy logs. Do not allow them to catch on fire, but clear around with a spade or otherwise keep the fire off, as any elevated fire will throw off sparks and lighted cinders—the stronger the wind the greater the danger of a fire starting again. Members generally endorsed Mr. Forster's recommendations, and urged the necessity for precautionary measures, especially in a season like the present, when there is so much grass and other herbage about. Landowners adjacent to railway lines were advised to take special precautions by making adequate firebreaks parallel to the railway.

Stansbury, January 2.

PRESENT—Messrs. Anderson (chair), Sherriff, Faulkner, Antonio, and Cornish (Hon Sec.).

WHEAT AT ADELAIDE SHOW.—Discussion took place on conditions attached to the offer of special prizes for wheat at the Adelaide Show, and it was decided that this Branch could not compete. Discussion on rust-resisting wheats also took place.

Wandearah, January 4.

PRESENT—Messrs E. H. Eagle (chair), W. and R. Roberts, Birks, Mundy, Dick, Halliday, and E. J. Eagle (Hon. Sec.).

ICE PLANT.—Several members reported experience with this weed. No stock would touch it if there was anything else to eat· it choked out all other herbage and is most difficult to kill It was resolved that in the opinion of the Branch the "ice plant" should be declared a noxious weed, and its eradication strictly enforced.

WHEAT AT ADELAIDE SHOW. Members decided to take no action in respect to prizes offered for best exhibit of wheat at the Adelaide Show. Several members considered that the money awarded would simply be thrown away, as owing to the conditions being impracticable no good would result.

STANDARD BUSHEL. The action of the Corn Trade Section of the Chamber of Commerce in respect to this matter was strongly condemned; first, on account of the late date selected for fixing the standard for the season; and, second, on the ground that 61½ lb. was needlessly low, and detrimental to the best interests of the State Members pointed out that owing to the delay in fixing the standard a large quantity of wheat was sold under the previous season's standard of 63 lb. per bushel, with consequent loss to many farmers.

Murray Bridge, January 1.

PRESENT—Messrs. Jaensch (chair), Edwards, Kutzer, W. and H. Schubert, Stecker, and Lehmann (Hon. Sec.).

CONCRETE FOR FLOORS.—Mr. H. Schubert read a paper on mixing concrete and making floors. In this country concrete floors, while very serviceable, can be put down cheaply. To make a floor to last for many years without wearing requires some little experience. To obtain the best wearing surface the floor should be put down in winter, as it will dry slowly and better than in hot weather. Use only the best lime at the rate of one part of lime to three parts of best clean sand and gravel mixed. Dissolve the lime in a tub and keep it stirred to prevent it settling, then mix with the sand and gravel. Allow the mortar to stand a day before laying, as this will prevent the floor from cracking. Lay the mortar evenly, and stab it down with the shovel to get the largest stones and gravel to the bottom. Tamp well with a broad rammer to get it as solid as possible. To obtain a good hard even surface moisten the surface and float with cement if there are no small stones on the surface. If the surface is somewhat rough give it a coat of sifted mortar before cementing. Use a small trowel, pressing heavily upon it to get a smooth surface, and do not have the floor too wet. To keep the floor from drying too quickly cover it with wet bags, but on no account have the bags so wet as to drip. Another method is to mix one part of fresh burnt lime with two parts of coarse clean sand and two parts small broken metal. Mix the lime and sand first, then add water, and afterwards mix in the metal. The mortar should be put down as before described.

Onetree Hill, January 7.

PRESENT—Messrs. Hould (chair), Barritt, Bowman, Flower, Hogarth, Smith, Thomas, and Clucas (Hon. Sec.).

FARMING.—Mr. Hogarth read a paper on this subject. A good many people without much practical experience of farming speak of the occupation as a very profitable one, and no doubt it is to many. On the other hand, many find it an unprofitable business. Still, even in those districts where the rainfall averages 14 inches or more, and the farmers are, as a rule, in fairly comfortable circumstances, it is not the money-making business it is supposed to be. Some people, when they hear of crops going 20 bushels per acre and wheat selling at 3s., will say that with the costs at 18s. to 20s. this leaves a profit of £2 per acre. These people overlook the fact that to grow this crop the land has to be in fallow the previous season, and the returns must therefore be divided by two. Taking the State as a whole, it seemed to him that farming did not pay. Assuming that there is an average yield of 8 bushels of wheat, it does not need much calculation to show that at 3s. per bushel wheatgrowing does not pay. True, the farmer may be able to pay his way, but what does he get for his labour? Practically nothing, besides losing interest on his capital. Those in the dry areas are in a very much worse position, as the average there probably does not exceed 4 bushels per acre. These men have lost their money and the best use of their lives, and with the twenty years' experience in mind it did seem madness to keep on trying to grow wheat there. In his opinion the only way to profitably utilize the land outside the line where the rainfall will permit of an average of 10 bushels per acre being obtained, would be to let or sell it in blocks of sufficient area to carry 5,000 to 7,000 sheep. If that were done the State would have this land occupied by a fairly prosperous community instead of a greater number of farmers unable to make a decent living. Farmers were often told they should grow maize, sorghum, and other summer crops, and keep more stock, but this could not be done everywhere. In some districts, for instance, maize will do well, and yet only a few miles away it will not pay for the outlay. With these crops everything depends upon the location, soil, and the rainfall. There was one other matter he would refer to, and that was the question of co-operation. There was a certain kind of selfishness which was simply self-preservation, and it would be well for farmers if they would exercise a little of this selfishness. There was quite an army of middlemen living on the profits made out of the produce grown by the farmers, and there was no good reason why the farmers should not be able to keep some of these profits for themselves, and at the same time reduce the cost to the consumer. This could, however, only be brought about by the whole of the farmers joining the Farmers' Co-operative Union. It was no use for farmers to stand out to see how the thing would work out, as this was the stumbling-block to the success of any such co-operative scheme. Many farmers appear to think that by joining a Co-operative Union they give up their right to do as they please with their own. In this they were mistaken, as they could sell when they liked, or hold it for better prices; all that would be required of them was to sell only through the Union. Many farmers were content to do just as their fathers did, and while contentment was a good thing up to a certain point, a certain amount of discontent and desire to do better was necessary to success. The man who was content to grow 12 bushels of wheat per acre while his neighbour produces 20 bushels is not the sort to make the world better for his having lived in it. A long discussion ensued, members generally agreeing with the paper.

Tatiara, January 9.

Present—Messrs. Fisher (chair), Stanton, Wiese, Smith, and Bond (Hon. Sec.).

South-Eastern Conference.—It was decided that the Annual Conference of South-Eastern Branches be held at Bordertown during the first week in April.

Bot Fly.—Mr. Stanton reported that what was reputed to be the bot fly had been noticed in this district.

Utera Plains, January 4.

Present—Messrs. R. Deer (chair), Venning, Hahnhardt, Hall, J. Deer, and Ramsey (Hon. Sec.), and one visitor.

Rust-resisting Wheats.—Mr. Venning read a paper on this subject, dealing with the different varieties he had grown. Jacobus No. 1 was fairly early, stands up well, does not shake, is fairly good for hay, but, owing to requiring more moisture than the district usually gets, the sample is not always good. Gluyas Early yields well, does not shake, but is a poor hay wheat. It should be sown after mid-season. Marshall's No. 3 stands well, does not shake, should make good hay, but this district is rather dry for it Pike's Excelsior is a good rust-resisting wheat, but shakes badly, makes good hay, but requires a moister district. Allora is fairly rust-resistant, stands up well, but shakes out a little, yields a good sample, but is poor hay. Earliest of All yields fairly well and a good sample, it does not shake out, but will go down badly. Last year, on land cropped the previous year, he sowed several varieties, manuring the sand ridges, which run through all the strips, with super Twenty-nine acres sown with Jacobus No. 1 yielded 35 bags of wheat; 31 acres of Marshall's No. 3 yielded 28 bags, 14 acres of Allora yielded 18 bags; 39 acres of Jacobus No. 4, which is liable to rust, and shakes out, yielded 46 bags.

Bleached Wheat.—The Hon. Secretary initiated a discussion on the milling value of bleached wheat and the action of the wheatbuyers in docking bleached samples. A resolution was also carried that in the opinion of members wheat weighing over the standard should be paid at the rate of ¼d. per bushel per lb. more than standard sample, as this would induce farmers to clean their wheat better.

Ophthalmia in Cattle.—Discussion took place on the cause of blindness in cattle, a number of animals in this district suffering from the complaint

Port Pirie, January 9

Present—Messrs. Johns (chair), Williams, Smith, Bell, Wright, Crispin, Spain, and Hector.

Ice Plant.—Discussion took place on offer of Department of Agriculture to undertake experiments in the destruction of this weed, and it was decided to arrange to carry out the experiments as soon as the young plants appear.

Officers.—Mr. G. M. Wright was elected Chairman, Messrs. W. Smith and G. Hannan Vice-Chairmen, and Mr. T. A. Wilson Hon. Secretary for ensuing year.

Longwood (Mylor), January 9

PRESENT Messrs Nicholls (chair), Hemer, Mundy, Cheeseman, and Hughes (Hon. Sec.), and five visitors.

WHEAT AND OATS FOR HAY.--Mr. J. Roebuck stated that he had grown White Tuscan wheat with Algerian oats for hay, and found it a good mixture.

EXHIBITS.—Seven varieties of plums and six varieties of apples were tabled, all the fruit being of good quality.

SHORT-WEIGHT MANURE. - Mr. J. Roebuck stated that he purchased eleven bags of local-made bonedust, each supposed to weigh 1 cwt., and on weighing them he found them short to the extent of 77 lb. in all., or an average of 7 lb. per bag short. Members wished to bring this matter before the Council of Agriculture with a view to some action being taken. It was suggested that it might be possible for the Inspector of Fertilisers to test the weights of bags of manure occasionally, or the attention of the Inspector of Weights and Measures might be drawn to the fact that bags marked and sold to contain 1 cwt. of manure only contain 105 lb.

Clarendon, January 11.

PRESENT—Messrs. Payne (chair), A. and A. A. Harper, Juers, W. and J. Spencer, Phelps, Dunmill, Hilton, Piggott, Morphett, and Wright (Hon. Sec.), and three visitors.

BUSINESS. -Several matters of local interest were discussed. Some discussion on the conduct of the meetings took place, and it was agreed that there should be some paper or definite subject for consideration at each meeting. It was decided that members take it in turn to read a paper, and, in the event of the member whose turn it is to write a paper not being present at the meeting, he shall forward the paper to the Hon Secretary, or read it at the next meeting.

Balaklava, January 9.

PRESENT Messrs. Manley (chair), Burden, Neville, Reid, Robinson, Smith, Tiller, and Black (Hon. Sec.).

RUST-RESISTING WHEAT. -Discussion on this subject took place, and the merits of the different rust-resisting wheats grown by the members were dealt with. The members placed the wheats in the following order of merit - - Marshall's No. 3, Carmichael's Eclipse, Gluyas, Rerraf, Silver King, Budd's Rust-resistant, Gray's Early, and Allora. Members were unanimous in placing Marshall's No. 3 as the best wheat, and strongly recommend all farmers in the district to grow it. Silver King and Rerraf, which have been grown by several members, were strongly recommended for further trial.

Port Elliot, January 16.

PRESENT -Messrs. McLeod (chair), Williamson, Nosworthy, Welch, Pannel, W. E. and W. W. Hargreaves (Hon. Sec.).

ANNUAL REPORT.—The Hon. Secretary's annual report showed that twelve meetings had been held, with an average attendance of 7.75 members. During the year nine papers had been read and discussed and two homestead meetings held. Messrs. J. McLeod and W. W. Hargreaves were re-elected Chairman and Hon. Secretary respectively.

WHEAT EXPERIMENTS.—Mr. Welch tabled very fine samples of Marshall's No. 3 wheat taken from a paddock of good land manured with 1 cwt. wheat manure. The yield was 27 bushels per acre. Some poorer soil manured with 1 cwt. bonedust per acre averaged 20 bushels, while poor, sandy soil, with same manure, went 16 bushels. Majestic and Marshall's No. 3 wheats were highly recommended for resistance to rust.

DAIRY CATTLE.—Mr. Welch read from January issue of *The Journal of Agriculture* article on this subject by Mr. G. S. Thomson, and some discussion ensued.

Paskeville, January 9.

PRESENT - Messrs. Pontifex (chair), Goodall, J. C. and S. R. Price, Meier, and O'Grady (Hon. Sec.).

NORTHERN YORKE'S PENINSULA CONFERENCE.—At last year's Conference it was decided that the 1904 Conference of Northern Yorke's Peninsula Branches should be held at Paskeville. Arrangements have been made to hold the Conference on February 26.

SEED WHEAT. Mr. J. C. Price initiated a discussion on this subject. He considered it would pay to grade the wheat intended for seed and sow only the best. He advised members to combine to purchase a grading machine, each one using it in turn. Members were disposed to favourably consider this suggestion. The Chairman referred to results obtained by selecting only the best heads in the crop for seed, and thought it would pay farmers to attempt something of this sort.

Gawler River, January 8.

PRESENT- Messrs. Parker (chair), Dawkins, H. and F. Roediger, Leak, Winckel, Barrett, Spencer, Hillier, and Bray (Hon. Sec.).

RAPE. Mr. C. Leak read a short paper on the cultivation of rape. He thought rape would take the foremost part as a fodder for the production of feed in districts where, during the dry months, succulent food was scarce. One great advantage it possesses over other plants is its earliness. It is fit for grazing within eight or nine weeks from the germination of the seed. This is of special importance to dairymen. For sheep also it is invaluable, as a farmer can make sure of good feed for his ewes and lambs. The quantity of feed produced by a good crop of rape is astonishing. Rape will be found a very useful feed for pigs, and poultry will benefit greatly from a liberal supply of succulent food like rape. To grow rape successfully the ground should be prepared as soon as possible after harvest. Where available, stable manure can be used with great advantage. Harrow the land down well, and secure a good tilth; sow seed in drills as shallow as possible, or broadcast and harrow lightly. Three pounds of seed per acre will be sufficient. Where only small areas are grown it pays best to cut the rape and feed it; but with larger paddocks it should be grazed, care being taken not to allow stock to eat too much of the green food for a few days, until they are accustomed to it. Mr. F. Dawkins thought small patches best, as stock do not take readily to rape at first if they have a large area to roam over. Members considered it advisable not to feed dairy cows with rape at milking time.

Yorketown, January 9.

PRESENT Messrs. Koth (chair), Latty, Anderson, Domaschenz, Corlett, Sabine, and Newbold (Hon. Sec.).

WHEAT AT ADELAIDE SHOW. Considerable discussion on this subject took place. Members were of opinion that the condition requiring exhibitors to keep on hand fifty bags of wheat similar to that exhibited would cause much inconvenience, and possible loss, to exhibitors. Twenty bags should be ample for the purpose of the Society. It was decided that members bring samples of wheat to next meeting, with a view to selecting the best for competition.

Cherry Gardens, January 12.

PRESENT—Messrs. Partridge (chair), Jacobs, C. and J. Lewis, Broadbent, Matthews, Burpee, Brumby, Stone, and Ricks (Hon. Sec.).

POTATOES FROM SEED.—Mr. Jacobs tabled some very good potatoes, the third growth from seedheads. From three setts sown this season he got 2¼ lb. of potatoes.

PIG-BREEDING.—Mr. Partridge read clipping from newspaper on pig-breeding, and discussion ensued.

Kingscote, January 18.

PRESENT—Messrs. Turner (chair), Wright, Bates, Nash, Melville, Carter, Bell, Ayliffe, Whittle, and Cook (Hon. Sec.).

POULTRY.—Mr. V. H. F. Cook read a paper on "My Experience with Poultry." He commenced his experience with poultry as a boy, and for the past twenty years had had more or less to do with them, trying the various breeds popular at different times. For several years he had been crossing the English Game with Indian Game, with a little Malay and White Pile blood in them, and was well satisfied with the result. The birds were very hardy and splendid foragers, almost earning their own living when green feed was abundant. They were fair layers of a medium-sized egg, and as table birds were unsurpassed, cockerels at four months weighing up to 6½ lb. Their appearance was certainly against them, but they paid well as table fowls. Last year he raised 200 chickens, and had no difficulty in disposing of the cockerels at good prices. He was now mating a good Silver Wyandotte rooster with the best of his hens, and expected to considerably improve the laying capabilities of his flock without impairing their table qualities. He thought there was a good opening for an export trade in poultry. Farmers could rear birds that at four to six months old will weigh up to 6 lb. It wa necessary to introduce fresh blood into the flock frequently. Crushed bones were very useful, especially for growing chicks, and shell grit was also necessary, especially if the birds are fed on whole feed. For layers oats were the best feed, but for winter barley was superior. Considerable discussion ensued, most members taking part. One member said he found the Malay too delicate for the island.

BOT FLY.—Mr. Nash referred to this subject, and stated that he felt sure that on two out of every three horses in Kingscote that day the eggs of the bot fly would be found under the jaw. The Hon. Secretary recommended the application of weak carbolic occasionally on the parts where the eggs are laid.

WHEAT ON POOR SOIL.—Mr. J. Olds forwarded sample of Marshall's No. 3 wheat grown on his farm. Members were surprised at the quality of the wheat, as the land was exceptionally poor.

Virginia, January 4.

PRESENT Messrs. Hatcher (chair), Strempel, Nash, Taylor, Sheedy, Thompson, Johns, and Ryan (Hon. Sec.), and seven visitors.

HAYMAKING. Mr. S Johns read a paper on this subject. Consideration should be given to haymaking when seeding time is at hand, and a portion of the land to be cut for hay should be sown with an early variety of wheat, so that operations can be commenced in good time, instead of having to rush things, as is the case when only the later varieties were sown, besides which, the hay can be harvested even in colour, whether with a green tinge or with a little grain in it, as may be desired. The early cut hay must be stooked very carefully, as being more sappy than the late crop it is more liable to sweat. He favoured long, narrow stooks, not more than five sheaves wide, and the sheaves standing upright. In cold weather it is better not to stook more than four sheaves in width, but care must be taken to stand them flat and not on edge. If stood flat on end there will be a passage way through the stook, and the rain will not penetrate. As the weather gets warmer round stooks will be all right. Carting should not be started until the hay has been three weeks in the stook during the early part, but later on a fortnight will be sufficient unless the hay has been cut very green. The farmer must, of course, exercise his own judgment, but must always see that it is fit to stack, as a little sweating will ruin a large proportion of the hay. In stacking, the farmer should decide how much hay he is likely to sell within a month or two, and how much he will hold, as the hay should be stacked differently. Hay that is only to remain in the stack for a month or two does not need to be as carefully stacked as that which will remain for an indefinite time. The latter must be built up with great care, well batted, and the middle kept high from start to finish, especially at the roof. Members were divided in their opinions on the merits of stooking the sheaves flat or standing up. Some members who favoured the former practice stated that, notwithstanding the exceptionally wet season, their hay had been injured very little.

Mallala, January 11.

Present—Messrs. McCabe (chair), Jenkins, Wilson, Nairne, Loller, East, Moody, Temby, Churches, Marshman, and Stephenson (Hon. Sec.), and two visitors.

Harvest Results.—A lengthy discussion on this subject took place, and it was resolved that a fair estimate of the yield of this district would be 15 bushels of wheat per acre and 1¼ tons of hay per acre. Marshall's No. 3 and Majestic were highly spoken of as rust-resisting and Neumann's, Gluyas, and King's Early as rust-escaping wheats. Owing to the heavy summer rains there is an exceptional growth of weeds on the fallows. Farmers keeping sheep have a good supply of green feed for them.

Mundoora, January 8.

Present—Messrs. Harris (chair), Shearer, Button, Mitchell, Angley, Aitchison, Mildren, and Gardiner (Hon Sec.) and one visitor.

Wheats.—Discussion on rust-resisting wheats took place. Marshall's No. 3, Phillis Marvel, Budd's Rustproof, and Carmichael's Eclipse have given best results here this season. Mr. Mildren tabled three samples of wheat for examination, one being above the standard fixed by the Chamber of Commerce, and two below it. The Secretary tabled sample of Argentine wheat, imported last year for milling purposes Members considered this very inferior, even when compared with the worst of locally grown wheat. The members expressed the hope that the time was not far distant when the Federal Government will be able to draw up a Bill to fix a fair and permanent standard for wheat, and thus in some measure do away with the present system, which, in a year like the present, proves so detrimental to the interest of such a large proportion of the community.

Swan Reach, January 16.

Present—Messrs. Baker (chair), Arnold, Hasse, Rowe, and Harris (Hon. Sec.), and one visitor.

Oats for Feed.—Mr. J. L. Baker read a paper on this subject. Though many farmers seemed to fear that their ground will get overrun with oats if they feed their stock on them, oats were coming more into favour each year for feeding purposes. He believed that the farmer should produce on the farm everything required for feeding his stock, and thus save the outlay in purchasing bran and pollard. He preferred to feed oats dry, mixed with cocky chaff, giving about 1¼ gallons of oats per horse per day. He found this much better than boiled or crushed wheat, bran, and pollard. The horses keep in better heart and condition, are active, and do not suffer from sore shoulders. Where only a few horses have to be attended to it is a good plan to have two feeding troughs and prepare the feed a meal ahead by just covering the oats with as much water as they will soak up, and allow them to swell before mixing them with a little bran and pollard and cocky chaff. He considered the prices of bran and pollard too high. These feeds were splendid for pigs, and, of course, useful for poultry, but for horses they were not, compared with oats, worth the prices asked. In this district bran and pollard cost nearly twice as much per pound as Algerian oats, and more than good white or grey oats, and the latter were of higher feeding value. Besides this, the farmer can grow the oats on his farm, and get heavy yields, even when wheat will not do well. This year as much as 40 bushels of oats per acre has been harvested on the river. Members generally agreed that it was advisable to grow sufficient oats for feeding purposes.

Dairying.—It was decided to make enquiries as to terms on which a purebred Shorthorn or Holstein bull could be secured by the Branch. Members consider the Jersey too small for this district, as beef production and dairying must be combined.

Gristing Wheat.—A good discussion took place on the question of gristing wheat or selling the wheat and buying flour. Most members preferred to send their wheat to the mill for gristing.

Crystal Brook, January 2.

Present—Messrs. R. Pavy (chair), P. Pavy, Hutchison, Hamlyn, Venning, Dabinett, Davidson, Morrish, and Symons (Hon. Sec.).

Poultry.—Mr. P. Pavy read a short paper on "Money in Chickens." There was no branch of rural industry at the present time that presented such room for expansion or held out greater reward to persons of limited capital than that of poultry raising. According to *The Australasian*, chickens up to twenty weeks old have been fetching 6s. to 8s. per pair, and turkey gobblers up to 15s. each. These prices, of course, were only for prime birds, and it was stated that a recent visitor from London had left a standing order for suitable chickens for export at 6d per lb. live weight. Such a price would leave an ample margin for profit to any one taking up the business in a systematic way. There was practically an unlimited market in Great Britain for eggs and poultry, and as our spring and early summer corresponded to autumn and early winter, when poultry products were scarce and dear in England, Australia should have a large share of the trade. For turkey raising it would be necessary to use the American Bronzewing turkey, the largest and best of all. Local conditions were specially adapted to turkey rearing. They must have plenty of run and natural shelter, and will forage for their food, a small amount of grain each evening in addition to what they pick up for themselves being all that was necessary

Lyndoch, January 7.

Present Messrs. Alfred Springbett (chair), Arthur, W. J., and H. Springbett, Woolcock, Zimmermann, Warren, Ken, Ross, Schenke, and Mitchell (Hon. Sec.).

Shoeing Horses. Mr. F Warren read a paper on "The Horse's Foot and Shoeing." He described the various parts of the foot and the uses of the parts, also results of improper treatment by the smith when shoeing. As regards shoeing, the shoes must be made to fit the foot and be brought well in at the heels, and not encroach upon the frog. For harness work the shoe must be carefully fitted to the foot and nailed with five nails on the front and six nails on the hind foot, two nails should be driven on the inside and three on the outside, near the toe. The nails should be driven into the foot and brought out as soon as possible, clinch well, and do not rasp afterwards. The frog should on no account be cut with the knife; our smiths were too fond of cutting. The shoe should be well bedded down, with no daylight showing at the heels; but in front there should be a space the thickness of ordinary paper between the shoe and foot, to save jarring. On some horses it will be noticed that the toe of the shoe is worn round. When this is the case the new shoes should be shaped with a slight curve, as it will probably save the horse from stumbling.

Loss of Dried Fruit.—Mr. Woolcock tabled samples of dried apricots destroyed by the recent storm, which had caused considerable losses.

Naracoorte, January 8.

Present—Messrs Forster (chair), Duffield, Williams, Wardle, Caldwell and Schinckel (Hon. Sec.)

Harvest Some discussion on harvest returns and the effects of rust took place.

Brands Act.—Kingston Branch called attention to paper read by their Chairman, and some discussion on the question of urging the Government to amend the Brands Act to provide for waybilling of all travelling stock took place. Members generally appeared to agree with the paper, and it was decided to consider the matter fully at next meeting.

Rust.—Members placed Gallant first as a rust-resisting wheat for this district, then Marshall's No. 3. Marshall's No. 2, Silver King, Gamma, and Majestic were also recommended for trial on a larger scale.

Manure Experiments.—Mr. S. H. Schinckel reported on experiments with different manures. Plots of two acres each were sown in April with 1 bushel per acre of Gallant wheat, and the crop cut for hay. The following results were obtained:—Plot A.—112 lb. mineral super; yielded at rate of 3 tons 4 cwt. 2 qr. 18 lb. per acre; value of crop, at 30s. per ton, £4 16s. 9d.; cost of manure, 5s. 7d.; gain in favour of manure, £2 10s. 4d. Plot B.—140 lb. mineral super; yield, 3 tons 13 cwt. 3 qr. 24 lb.; value of crop, £5 10s. 6d.; cost of manure, 7s.; gain in favour of manure, £3 2s. 8d. Plot.—112 lb. mineral super and 56 lb. nitrate of soda; yield, 3 tons 18 cwt. 2 qr. 4 lb.; value of crop, £5 17s. 9d.; cost of manure, 12s. 8d., gain in favour of manure, £3 4s. 8d. Plot D.—112 lb. phos. powder; yield, 3 tons 15 cwt. 0 qr. 10 lb.; value of crop, £5 12s. 6d.; cost of manure, 5s., gain in favour of manure, £3 6s. 8d Plot E. 112 lb. wheat manure; yield, 3 tons 10 cwt. 1 qr. 16 lb.; value of crop, £5 5s. 4d.; cost of manure, 6s.; gain in favour of manure, £2 18s. 6d. Plot F.—112 lb. bone super; yield, 3 tons 8 cwt. 2 qr. 15 lb.; value of crop, £5 2s. 9d., cost of manure, 7s.; gain in favour of manure, £2 14s. 11d. Plot G.—112 lb. guano super, yield, 3 tons 6 cwt. 2 qr. 1 lb., value of crop, £4 19s. 9d.; cost of manure, 5s. 4d., gain in favour of manure, £2 13s. 7d. Plot H.—112 lb. Thomas phosphate; yield, 2 tons 1 cwt. 1 qr. 3 lb.; value of crop, £3 1s. 10d.; cost of manure, 5s.; gain in favour of manure, 16s. Plot I.—No manure; yield, 1 ton 7 cwt. 1 qr. 9 lb.; value of crop, £2 0s. 10d. The yield and profit in each case are stated at per acre. A hearty vote of thanks was accorded to Mr. Schinckel for his very interesting report.

Nantawarra, January 21.

Present—Messrs. Dixon (chair), Sleep, Herbert, Dall, Belling, Pridham, and Nicholls (Hon. Sec.), and one visitor.

Ice Plant.—This weed is practically unknown in this district, but in view of the damage caused elsewhere by it members are of opinion that it should be declared a noxious weed.

Rust-resisting Wheats.—Members placed Marshall's No. 3 wheat as first, Baroota Wonder second, and Gluyas third, as regards this district Carmichael's Eclipse, Neumann's Early, and Steinwedel were considered worthy of mention as rust-resisting or rust-escaping.

Standard Sample of Wheat.—Members failed to see the consistency of the Chamber of Commerce in fixing the standard for the year at 61¼ lb., when according to the circular asking for samples, only wheat purchased at full market rates on last year's standard of 63 lb were taken into account.

Strathalbyn, January 18.

Present—Messrs. M. Rankine (chair), W. M. Rankine, McAnaney, Cockburn, Blake, Reed, and Cheriton (Hon. Sec.), and five visitors.

Breeding Draught Horses.—By invitation, Mr. J. H. G. Moir, of Adelaide, gave an address on this subject, dealing with the relative merits of the Suffolk Punch, Shire, and Clydesdale horses for farm work. Numerous questions were asked and answered by Mr. Moir, who strongly favoured the Clydesdale, and a hearty vote of thanks was accorded him for his address.

Bleached Wheat.—A discussion on this subject was initiated by the Chairman, who characterised as absurd the contention that wheat merely bleached was inferior for flour-making purposes. He considered that bleached wheat was confused with damaged wheat. Members agreed with the Chairman.

Southern Conference.—It was resolved to hold the twelfth annual Conference of Southern Branches at Strathalbyn, on Thursday, March 31. [As April 1 is Good Friday, it has been suggested that this Conference be held a week earlier than proposed. Will members of Branches in the South please take early steps to assist the Strathalbyn Branch in making this gathering a success.—Ed.]

Holder, January 23.

Present—Messrs Rowe (chair), Blizard, Phillips, Tuck, Jones, Horwood, Allen, and Green (Hon. Sec.), and six visitors.

Name of Branch.—It was decided that, subject to the approval of the Council of Agriculture, the name of the Branch be changed to Waikerie, as the members are all residents of the latter district.

Rutherglen Fly.—Mr. Vaughan reported that the Rutherglen fly was very numerous in his vineyard, and several vines were already showing the effects of their attack.

Lipson, January 2.

Present—Messrs. Potter (chair, Brown, Carr, Brougham, McCallum, Baillie, Bratten, and Barraud (Hon. Sec.), and three visitors.

Wheat Samples. Discussion on prizes offered for wheat at Adelaide Show took place, and it was decided that members bring samples to next meeting, when they will be weighed, with a view to selecting the best for exhibition Various samples of new season's wheat were shown. Two samples of Silver King went 65 lb. per bushel; Red Straw, 64 lb.; and Marshall's No. 3, 66 lb.

Wheat and Drake.—Mr. Bratten wished to know whether there was any truth in the idea, held by some farmers, that under certain conditions wheat would degenerate to drake. [None whatever. Wheat and drake are distinct plants, and it is just as impossible for a plant of drake to develop from a grain of wheat as it would be for a plant of wheat to grow from an oat seed. - Ed.]

Longwood, January 30.

Present—Messrs. W. Nicholls (chair), J. Nicholls, Smith, T. G. and E. J. Oinn, Mundy, Narraway, Vogel, Hewer, and Hughes (Hon. Sec.), and six visitors.

Exhibits.—A splendid collection of plums, pears, apples, peaches, rhubarb, and butter beans was exhibited, and a lengthy discussion ensued on the merits, etc., of the fruits tabled. Mr. E. J. Oinn showed lucerne 2 ft. 6 in. in height, the second cut from seed sown last November.

Ardrossan, January 23.

Present—Messrs. C. Dinham (chair), Cornish, Henderson, Barton, Allison, R. Dinham, and Opie (Hon. Sec.).

Homestead Meeting.—Meeting was held at residence of Mr. C. Dinham, an inspection being made of the stock, outbuildings, etc. The effects of the wet summer were seen in the stubble paddocks, there being so much growth of wheat since harvesting that it is unsafe to turn stock in, while portions of the stubble land will repay a second stripping.

Cumeracha, February 1.

Present—Messrs. Moore (chair), Cornish, Stephens, Norsworthy, A. E. and W. A. Lee, Monfries, and Martin (Hon. Sec.).

Annual Meeting.—Messrs. J. Monfries, H. W. Norsworthy, and T. W. Martin were elected Chairman, Vice-Chairman, and Hon. Secretary for ensuing year, and a vote of thanks was accorded to retiring officers. It was decided to endeavour to arrange for a demonstration in summer pruning by Mr. Quinn at an early date.

Port Broughton, January 28.

Present—Messrs. Harford (chair), Barclay, Tonkin, Bates, Pattingale, B. and W. Excell, Button, and Dalby (Hon. Sec.).

Standard Weight of Wheat.—Considerable discussion on this subject took place. This is a very vexed question amongst the farmers, and strong feelings are expressed on the subject. Members were unanimous in condemning the present system, and it was resolved that in their opinion legislation should be passed adopting a fixed standard.

Exhibits.—A turk's head pumpkin weighing 40 lb., cucumbers weighing 8 lb. each, and well-grown ears of maize were tabled. Samples of Petatz Surprise and White Tuscan wheats were also shown, the former weighing 68 lb. per bushel.

INDUSTRY.

SUPPLIED BY THE DEPARTMENT OF INDUSTRY.

Labor Bureau.

Number of persons registered and found employment by Government Departments and Private Employers from December 24, 1903, to January 27, 1904.

Trade or Calling.	Number Registered.		Number Employed
	Town.	Country.	
Laborers and youths	60	180	285
Carpenters	2	1	1
Masons and bricklayer	3	1	2
Painters	2	1	—
Boilermakers and assistants	1	—	—
Moulders	1	—	—
Fitters and turners	3	—	2
Patternmakers	—	—	1
Brassfinishers	—	—	1
Trimmer	1	—	—
Compositors	2	—	—
Baker	—	—	1
Attendant (female)	—	—	1
Apprentices	14	—	1
Cleaners	11	1	—
Porters and junior porters	15	3	
Rivet boys	8	—	4
Totals	123	187	299

January 29, 1904 A. Richardson, Bureau Clerk.

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AN ENQUIRY INTO SOUTH-EASTERN CONDITIONS.

BY ARTHUR J PERKINS, SECRETARY FOR AGRICULTURE

(Continued from pages 307, 349, and 382)

CRITICAL EXAMINATION OF INDIVIDUAL SOILS

(Continued)

2 MOUNT GAMBIER BLACK LOAM (MR SINCLAIR'S FARM)

We have here a good example of the rich Mount Gambier soil, that has done much towards creating a reputation for extreme fertility for this portion of the South-East The pity of it is that it does not cover a more extended area of country When, late in 1902 I was asked to interpret the results of analyses of Pinnaroo soils, and found myself compelled to describe them as poor in character, doubts were freely raised as to the possibility of distinguishing betwixt a poor and a fertile soil solely on analytical data I stated at the time that whilst it was quite possible to over-estimate natural fertility it was not, in my opinion, possible to under-estimate it At the same time, to deny any agricultural value to poor soils of the Pinnaroo type would argue but scant regard for the teachings of modern agricultural practice The soils are unquestionably poor, manures and sound practice will, however, equally unquestionably put them in a position to carry good crops The question for solution is always whether or not the game is worth the candle I have referred here to the Pinnaroo soils simply because in soil No 2, at present under consideration, and soil No 7, to be examined later on, we have two extremes an extremely fertile soil and a poverty stricken soil approaching in composition the worst of the Pinnaroo soils I would draw particular attention to their respective compositions, and I believe that it will be allowed that I am perfectly justified in stating that it is possible to distinguish between a fertile and a poor soil on the data of rationally conducted chemical analyses

In Table XII will be found summarised the chemical features characterising Mr Sinclair's soil

TABLE XII

Analytical Data	First six inches	Second six inches	First foot
	%	%	
Proportion of fine Earth	99 80	99 60	—
Moisture retained after air drying	3 51	3 93	—
Relation of Carbon to Nitrogen	9 50	7·40	—
	lbs per acre	lbs per acre	lbs per acre
Total Nitrogen	6,240	3,137	9,377
Total Phosphoric Acid	2,665	2,893	5,558
Potash soluble in strong Acid	3,364	2,925	6,289
Lime soluble in dilute Acid	6,322	6,305	12,627
Available Phosphoric Acid	228	114	342
Available Potash	585	260	845
Organic matter	132,389	51,789	184,178

Mr. Sinclair has been good enough to supply the following information concerning the recent cropping and yields of the paddock from which the samples were taken:—

TABLE XIII.

Seasons.	Crops.	Remarks.
1897-1898	Potatoes	Good yield ; clean skins
1898-1899	Wheat	20 bushels
1899-1900	Barley	40 bushels
1900-1901	Grass	Splendid feed
1901-1902	Grass	Splendid feed
1902-1903	Potatoes	7 tons per acre ; blistered in parts
1903-1904	Barley	Estimated crop, 40 bushels

The above results are certainly good, without, however, presenting exc tional features so far as the district is concerned. We may now proceed discuss the results of the soil analysis.

A soil showing over 99 per cent. of fine earth in both soil and subsoil is evidently unusually deficient in coarse material. According to circumstances this may or may not be a defect. In the present case I am inclined to look upon the fineness of the soil as rather an advantage than otherwise. When a soil is unusually rich in fine clay and proportionately heavy, the presence of coarse, gritty particles must always be looked upon as advantageous. In the present instance, however, the soil is somewhat light and not liable to cake, and the fine state of division of its component particles affords the root system of plants a greater surface from which by contact nutriment may be drawn.

The power of retaining moisture possessed by any given soil can, of course, be assessed only approximately by a mere statement of the amount found present after air-drying. Nevertheless, when the estimations are conducted under identical conditions, the results afford fairly accurate terms of comparison. The soil in question must be looked upon as but slightly retentive of moisture, a feature which certainly has its advantages in a somewhat exceptionally wet district. It may be remarked here that, however advantageous a heavy soil, highly retentive of moisture, may prove in dry districts, during seasons of average or heavy rainfall, they are always at a discount in dry years, from the very fact that they cling too tenaciously to what little moisture reaches them, and the plants are unable to utilise it to the same extent as in less retentive soils of a lighter character. On the other hand, it is only light soils of extreme fertility, such as the one under consideration, that give satisfactory results in very wet years. The poorer types of soil are apt to become leached of what little available plant food they may have contained, and the crops suffer accordingly.

With the two substances on which natural fertility mainly depends, viz., nitrogen and phosphoric acid, Mr. Sinclair's soil is abundantly provided. In the first foot of soil it contains nearly three times as much nitrogen and one and three-quarters times as much phosphoric acid as are usually found in good average soils. On the other hand, whilst potash is nearly up to standard requirements, there is a marked deficiency in lime. I propose discussing each substance separately and concurrently, with their probable availability, as revealed by chemical analysis.

Of nitrogen, 9,377 lb. per acre represents an abundant supply, although not, of course, approaching the 24,277 lb. noted previously for the Tantanoola peat soil. It is nevertheless true that a soil may at times be well stocked with nitrogen, and at the same time respond advantageously to nitrogenous dressings. This is largely the case when, through defective management, the readily available nitrogen has become exhausted, or is not present in sufficient quantities at those stages of growth of the plants when most in demand. A soil, however, that is both rich in nitrogen and in organic carbon, or organic [illegible] generally be looked upon as in good condition. The relation of [illegible] trogen, in the present instance, 9.5 in the soil and 7.5 in the subsoil, is fairly satisfactory for a comparatively light soil. It is, however, lower than that of any of the other soils we shall consider in the sequel. It should be noted in this connection that generally speaking this relation of carbon to nitrogen is under equal conditions lower in light soils than in heavy ones; lower in dry, arid regions than in moist, fertile ones; and, finally, lower in soils that are badly farmed than those on which skilful and intelligent treatment is brought to bear. Roughly speaking, the position may be summarised as follows:—The bulk of the carbon and nitrogen is found in combination in the organic matter of the soil; both under the influence of independent factors tend to disappear from soil that is tilled; the carbon, however, disappears more rapidly in a light soil, under arid conditions and on badly farmed land. A low ratio between carbon and nitrogen may therefore be taken as a good index to the state of fertility of the land at the time of examination

In other respects the availability of the nitrogen is largely dependent on the extent to which surrounding conditions favour the process of "nitrification," or its transformation into a soluble substance directly absorbable by the roots of the plants. Much depends, too, on the extent to which the nitrates are present when most required by the plants, i.e., for cereals in the early stages of growth. In a light soil, such as we are at present considering, which is favoured by a mild, moist climate, conditions are such as to ensure a satisfactory rate of nitrification, given good and careful tillage and a sufficiency of lime in the soil. In other circumstances, therefore, when a cereal follows a hoed crop, such as roots or potatoes, I do not anticipate that the use of nitrogenous manures is likely to prove profitable on this soil, when, on the other hand, a cereal follows a cereal, it is probable that light dressings of nitrate of soda or sulphate of ammonia would prove advantageous. In any case, the matter is worth testing.

Of total phosphoric acid, the substance in which South Australian soils are generally deficient, we find here the large amount of 5,558 ℔ to the acre, with the somewhat unusual feature of a greater proportion in the second six inches than in the first. Furthermore, there was available at the time of examination 342 ℔. per acre, or more than three times as much as in the Tantanoola peat soil previously examined It should be noted in this connection that whilst the total amount of phosphoric acid present is greater in the second six inches than in the first, the amount actually available in the first six inches is exactly double of that available in the second This may be accounted for by the greater amount of organic matter present in the surface soil. The amount of phosphoric acid available per acre one foot deep, viz., 342 ℔, is by no means excessive, and I am not prepared to affirm that here, contrary to what obtains in the rest of the State, phosphatic dressings are unnecessary. Notwithstanding the large amounts of phosphoric actually present in some form or other, I am inclined to the conclusion that phosphatic dressings will prove essential to the growth of exceptionally heavy crops

We notice next per acre, 6,289 ℔ of potash, of which not more than 845 ℔. is at present in available form. So far as cereals are concerned I am not inclined to think that dressings with potash manures are likely to prove profitable.

Finally, the soil contains 12,627 ℔ of lime to the acre, a quantity which in a heavy soil would certainly be looked upon as insufficient but which, in the present instance, may perhaps be looked upon as ample for the requirements of ordinary good plant growth. The apparent shortage of lime in this soil notwithstanding, I am not inclined to think that much benefit is likely to arise from "liming"

(To be continued.)

"JOURNAL OF AGRICULTURE."

From January 1, 1904, the "Journal of Agriculture" will be posted to anyone resident in South Australia bona fide engaged in the cultivation of the soil on payment of a REGISTRATION FEE of One Shilling per annum. Single copies will be supplied at 3d. each; back issues at 2s. 6d. per doz. The Indexes of Vols. I. to VI. can be obtained by members of the Agricultural Bureau and subscribers desirous of binding their volumes.

WINE AND SPIRITS STATISTICS.

By Arthur J. Perkins, Secretary for Agriculture.

Through the courtesy of the Collector of Customs I am able to supply herewith full details concerning the exports of our wines and brandies during the past year. To a very great extent they tell their own tale. Whilst commenting on the exports of the first nine months of 1903, I had occasion in our December issue to point out that owing to the falling off in our exports to London we were likely to show a big deficit in total exports towards the end of the year. We are now in a position to ascertain what our losses in this direction have really been.

I append in tabular form our exports to different parts of the world during the three years of federation compared with the average of the five years immediately preceding the removal of border duties:—

Countries.	Wines.				Wine Spirits and Brandies.			
	1903.	1902.	1901.	Average of five years, 1896-1900	1903	1902	1901	1900.
	galls.	galls.	galls.	galls	galls	galls	galls	galls.
New South Wales	98,092	66,927	45,317	5,722	16,169	13 911	2,558	424
Victoria ..	37,979	28,002	10,164	11,066	15,029	4,826	46	112
Queensland ..	30,528	29,273	18,742	5,592	4,070	1,034	351	262
West. Australia	24,019	22,328	19,041	21,277	3,076	2,510	522	83
Tasmania .	7,635	9,378	14,422	2,400	434	361	99	53
N'rth'rn Territ'ry	1,883	1,392	2,496	2,068	30	5	18	66
Commonwealth	200,136	157,300	110,182	48,125	38,799	22,647	3,594	1,000
United Kingdom	300,589	650,795	444 630	392,354	350	1,186	673	775
New Zealand ..	34,718	26,955	33,473	28,246	1,954	1,810	843	935
Other countries	26,172	10,368	7,568	9,708	581	76	—	294
Total Exports	561,615	845,418	595,853	478,433	41,684	25,719	5,110	3,004

It will be noted that exports of wine in 1902 exceeded those of 1903 by 283,803 gallons. This deficiency is due solely to a falling-off of exports to London, which have dropped from 650,795 gallons to 300,589 gallons, i.e., more than 50 per cent. In our December issue I entered sufficiently into detail on the events that have brought about this unnatural shrinkage in our exports. Let us hope that the new year has outlived them. The reduction in the export of wine is compensated somewhat by an increase of 15,965 gallons of brandies and spirits, representing roughly some 80,000 gallons of wine. The real shortage in exports is not represented, therefore, by more than 200,000 gallons.

The figures for the interstate trade offer far pleasanter reading. In wines we have now more than quadrupled the average exports of the pre-federal era; whilst, if we reckon wine and spirits together, we find that in 1903 we shipped to the other States the equivalent of nearly 400,000 gallons of wine, as against 55,000 in the days of the border duties. There is no gainsaying the fact that the wine industry has profited by federation. My earlier prediction that the interstate trade would soon eclipse our London trade appears to be within measurable distance of realisation.

THE DEVELOPMENT OF THE SEEDLESS CURRANT BERRY: A RECORD OF SOME EXPERIMENTAL WORK IN CONNECTION WITH THE MATTER.

By Arthur J. Perkins, Secretary for Agriculture.

Introductory.

A fruit, says Dr. E. Strasburger, in his recently published Textbook of Botany, *is the product of the changes induced by fertilisation in the persistent parts of the flower.*[*] Thus, from this definition it follows that, in the eyes of the botanist, not the seed alone testifies to successfully effected fertilisation, but every other portion of the flower that subsequently develops, such as the flesh of the peach, or the pulp of the grape. It is on this account that when, some short while back, Mr. W. C. Grasby expressed it as his opinion that the seedless fruit of the Zante currant, like a leaf or shoot, represented simply an ordinary phenomenon of growth in which fertilisation had no part, I felt bound to demur until sound scientific proof had been adduced in support of this view.[†] I pointed out at the time that the arguments that Mr. Grasby had put forward had done little towards justifying the position which he had taken up. They were, in fact, based largely on analogy with what he assumed to take place in the development of the seedless Navel orange, and a single experiment, the inconclusiveness of which I shall demonstrate in the sequel.

Whether or not the development of the seedless Navel orange may be ascribed to an ordinary phenomenon of growth, without the intervention of pollen, I am not at present prepared to say; nevertheless, I maintain that no more in this case than in that of the Zante currant can the abrogation of a well-established law in nature be admitted unless supported by incontrovertible scientific proof. For the latter, Mr. Grasby has on various occasions pointed somewhat vaguely to American literature on the subject. Now, although the Departmental Library is fairly well stocked with American publications, past and present, I can find in them nothing in the nature of definite proof that the Navel orange can be looked upon as developing without fertilisation. Statements, it is true, that such is the case are not wanting, but between mere statements and actual proofs there yawns a wide gulf, it may prove difficult to bridge. I take it, therefore, that so far as the Navel orange is concerned the existence of an alleged anomaly cannot be said to have been satisfactorily proved And I fail to see how a case that at best must be described as doubtful can be brought forward in support of what is now assumed, on the slenderest of evidence, to take place in the development of the seedless currant berry.

In addition to analogy, Mr Grasby had, I said, the support of a single experiment He emasculated a bunch of currant flowers, enveloped it in a bag, and awaited events. If, he stated at the time, the flowers set and developed into berries, he would be in possession of definite proof that in ordinary circumstances the intervention of pollen was quite superfluous. I shall have occasion to show in the sequel on how flimsy and unreliable a basis was built this superstructure of proof.

During the past season, to the extent that time permitted, in conjunction with Messrs. G. Quinn and F. W. Russack, I endeavoured to ascertain the bearing of a few facts in connection with the matter, and it is the result of our enquiries that I purpose summarising here to-day. With a view, however, to rendering intelligible to the general reader the bearing of what follows I must first digress from my immediate subject matter to the extent of describing the normal flower of the vine, and the process whereby it is converted into an ordinary seeded fruit.

The Flower of the Vine.

The vine has an altogether inconspicuous and short-lived flower, with which, notwithstanding its ubiquity in this land, but few are thoroughly familiar. Towards the end of winter it may be detected fully developed in a longitudinal section of an ordinary bud; later on, when the shoot emerges from its winter coat, we find the flower bunches attached to its lower nodes. Whilst in the spring months the shoot is gradually acquiring strength and length, the flower bunches on their side, with more rapid strides, reach their final normal dimensions, constituting ultimately "profusely branched panicles." The essential parts of each flower are enclosed within a single envelope, known as the *corolla*, the component parts of which correspond to the *petals* of the rose. The appearance of the vine flower at this stage is shown in Plate I., Fig. 1. Towards the end of October or beginning of November, according to districts, some of these small, bud-like bodies that form the flower bunch swell out considerably. This is an indication of the approaching expansion of the flowers. Driven thereto by gradually rising temperature, the *stamens* that are imprisoned beneath the *corolla* or *cap* are stimulated to sudden, upward growth, and under their combined efforts the *cap* is torn away from its base, in the form of a five-sided star, which finds a temporary resting place at the summit of the stamens, but ultimately falls to the ground (Fig. 2).

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[*] Strasburger Noll, Schenck, and Schimper, Textbook of Botany, English translation of fifth German edition (1903), p. 448.

[†] *Journal of Agriculture*, vol. vi., pp. 402 and 461.

Nature never wastes herself in fruitless effort, and does little without intent. Darwin's magnificent work in connection with the fertilisation of flowers has done much to bring these facts home to us, and in the early fall of the modest corolla of the vine flower we find a new illustration of them. The striking beauty of flowers, such as the lily and the rose, has been called into existence solely because of its usefulness, and perhaps because of this the aesthetic side of our being finds delight in it, and calls it beauty. The many coloured flowers that surround us, with greater artistic skill than modern advertisers, don their brilliant garbs with the sole intent of attracting passing insects; the latter in quest of nectar or pollen scatter about the pulverulent male element, carry it on their bodies from flower to flower, and render doubly certain possible fertilisation, and occasional, perhaps frequent, cross fertilisation. In all these flowers the brilliantly tinted petals remain attached to the flower after its expansion; nor do they wither away until sufficient time has elapsed to ensure the main object of every living organism, viz., the perpetuation of its species. On the vine we find modestly colored petals, differing but little in hue from the surrounding foliage; their only purpose in life is to protect the sexual organs in the early stages of growth. The flower once expanded, their period of usefulness comes to an end, and they fall to the ground, no longer a burden on the rest of the plant, and leaving revealed and unprotected the internal and essential parts of the flower (Fig. 3). A step further might even be taken. These humbly tinted flowers benefit by their enforced exposure; they have not developed the power of attracting active, bustling insects, and have, therefore, everything to gain by giving freest access to the pollen-laden breezes.

The internal parts of the flower shown in Fig. 3 are its sexual organs. The central, bottle-shaped body is the female organ or *pistil*, whilst the five erect, filamentous bodies that surround it are the male organs or *stamens*. The stamens consist of a more or less elongated stalk, bearing at its summit the pollen sacs or *anthers*, in which is enclosed the active male element, the fine, dust-like pollen, illustrated in Plate II. Shortly after the fall of the corolla these pollen sacs open out, giving issue to the fine pollen grains that float about in the atmosphere, some finding a final resting place on mature pistils, whilst the majority, as is occasionally the way with Nature, when

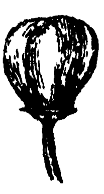


Fig. 1.

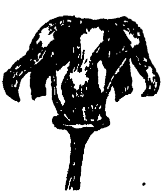


Fig. 2.

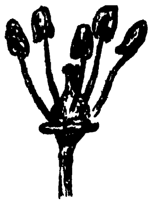


Fig 3.

PLATE I.

THE FLOWER OF THE VINE (after Bailey).

she has in view a more important end, are lost. The end aimed at is the formation of as great a number of seeds as possible. Hence the apparently wasteful profusion of pollen grains, but few of which eventually take part in the phenomenon of fertilisation.

The *pistil* consists of three parts—the body or *ovary*, in which are enclosed from two to four *ovules*, which develop into seeds after fertilisation; the *stigma*, a slight swelling at the summit, which becomes more or less viscid as the pistil matures, and retains pollen grains that happen to come in contact with it; and finally, the *style*, a slender neck, connecting stigma and ovary.

Such is the flower of the vine, and it has always been looked to as upholding Charles Darwin's view that Nature resorts to many devices to avoid the dangers of *inbreeding*. There are, in fact, many points in the phenomena that surround the expansion of the flower and its final fertilisation that would appear to support this view, and I must confess to have given them in the past considerable weight. On a closer examination of the question I am now inclined to think that long centuries of cultivation have wrought many changes in what appear to have been Nature's original designs. The disadvantages of inbreeding appear mainly in constitutional weakness of the offspring, and their inability to struggle successfully against more vigorous crosses. When, however, the seed, the starting point of the offspring, comes but rarely into play, as is the case with the cultivated vine, the disadvantages of close breeding disappear. Add to this that man, in his search after heavy, evenly-setting bunches, unconsciously eliminates all types throwing back towards Nature's original designs, and we can see how it is that, although Nature intended that vine flowers should, as much as possible, be pollinated by foreign pollen, man has come to somewhat modify this arrangement in accordance with his own special requirements.

Let us summarise the facts that lead one to suppose that in the uncultivated vine the flowers are generally cross-fertilised. We have in first line the fact that many wild vines bear nothing but male flowers, and consequently no fruit. There can be no other reason for the existence of such plants but the fact that the pollen which they produce in profusion renders more frequent the cross-fertilisation of the fruit-bearing individuals. Needless to add that the absence of any economic value in the former has long ago led to their complete exclusion from our cultivated varieties. Amongst the latter we find nothing but *hermaphrodite* flowers, i.e., flowers bearing both sexes simultaneously. Here, again, however, we are frequently met with phenomena somewhat analogous to those described by Darwin for the Chinese primrose and other plants, which tend to render cross-fertilisation a matter of necessity. In some varieties the flowers appear to be more or less completely self-sterile, i.e., the pollen grains appear incapable of fertilising ovules of the same flower or same bunch. Hence, fertilisation and the formation of seed must be secured by the aid of foreign pollen. This condition of self-sterility is generally accompanied by short, recurved stamens, such as are frequently found on the muscatels, and account for their defective setting. The fact that the sexual organs are naked and exposed, and the plant consequently anemophilous, i.e., wind fertilised, further indicates that cross-fertilisation is at all events courted. Whilst the anthers burst and shed their pollen almost immediately after the fall of the cap, the pistil does not become completely mature till twenty-four to forty-eight hours later. Finally, the stamens, that were originally erect against the pistil, turn right around when the flower expands, and make a strong angle with it, so as to shed their pollen away from the centre of the flower, and consequently away from the pistil.

All these facts point in one direction, viz., Nature's anxiety to avoid close breeding and its weakening influences. The inability of the vine flower to attract the attention of most insects has already been alluded to; nevertheless it is probable that it does attract, or has attracted in the past, in its native haunts, certain classes of insects that escape the notice of all but the closest observer. If this were not the case it would be difficult to account for the presence at the base of the stamens of nectar glands, in the form of a disconnected ring. The latter can serve no other purpose but to satisfy the wants of visiting insects. Again, the strong perfume exhaled by the opening flowers has been developed in all probability with a view to a similar end. These two facts complete the chain of evidence in support of the existence of a design aiming ultimately at cross-fertilisation of the flowers.

That this design has been perpetuated in our cultivated varieties I am much inclined to doubt. The selecting hand is no more that of Nature, but that of man. Nature, when unhindered, ruthlessly destroys those that do

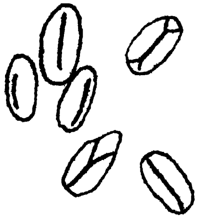


FIG 1. POLLEN GRAINS DRY

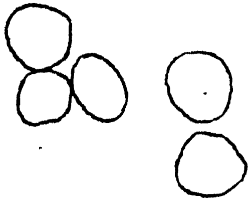


FIG 2. POLLEN GRAINS AFTER IMMERSION IN SUGAR SOLUTION

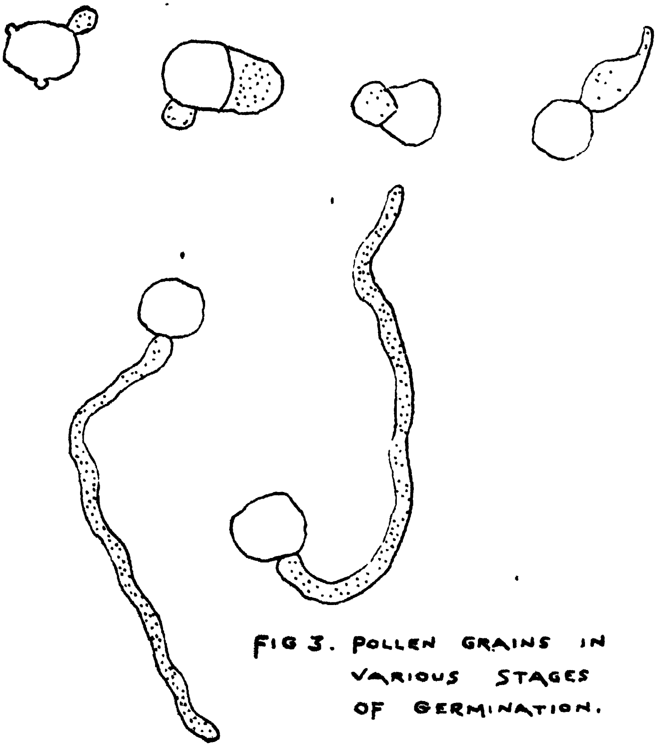


FIG 3. POLLEN GRAINS IN VARIOUS STAGES OF GERMINATION.

PLATE II.

Pollen Grains Magnified 380 Times.

not fall in with her special wishes; the fit alone survive to leave offspring behind them. Man, with equal ruthlessness, preserves only those that are able to supply in the highest degree his immediate requirements; and, in the cultivated plants, a new class of "fit" supplants Nature's "fit." Thus, male plants and self-sterile plants have gradually disappeared, and those alone whose natural fertility is beyond reproach have generally been allowed to survive. And amongst them in general it is probable that in the majority of cases individuals not adverse to self-fertilisation have found most favour. I may for the present bring forward a single instance of this fact which, during latter years, has frequently come under my observation. When the weather is cold and unfavourable the flowering of the vine takes place under difficulties. The caps, instead of separating themselves from the rest of the flower and falling to the ground, remain attached at the summit, completely enclosing stamens and pistil. In such circumstances, if the flowers set, it can only be by self-fertilisation. During the course of several seasons I have observed this enforced self-fertilisation particularly in the Shiraz vine, and in every instance the setting of the fruit has been satisfactory, pointing to the fact that this variety at all events exhibits no repugnance to self-fertilisation. To what extent the seed may have been weakened thereby cannot, of course, be ascertained, nor, as a matter of fact, does it offer any practical interest for us.

Having discussed fairly fully the flower of the vine and its normal method of fertilisation, I may now pass on to the result of our experiments with Zante currant flowers.

Germination of Zante Currant Pollen Grains

The enquiry opened with an examination of the pollen grains and their germinating powers These grains, like most of those of anemophilous plants, are perfectly smooth and dry They are colourless and almost diaphanous. Roughly speaking, in shape they are not unlike a grain of wheat, being about twice as long as they are broad, with a well-marked longitudinal suture down the centre (Plate II., Fig 1). Their minute dimensions account much for many of the errors that have apparently been made in connection with cross-breeding and hybridisation experiments. Each pollen grain is not much more than three to four times the size of ordinary yeast cells From numerous measurements that I made they average about [illegible] × [illegible] millimetres, or, roughly, [illegible] × [illegible] inches. Individual grains are, therefore, not only not visible to the naked eye, but continue so under the ordinary magnifying glass, that alone can be used in the open whilst the flower remains attached to the plant.

When immersed in a sugar solution, or merely in water, the pollen grains swell out and assume a more or less circular shape, with a diameter averaging [illegible] millimeters, or, roughly, [illegible] of an inch (Plate II., Fig 2).

When suitable conditions of temperature obtained, we experienced no special difficulty in getting these pollen grains to germinate in a fairly dense sugar solution. They germinated, in fact, quite as freely as the pollen grains of ordinary seeded varieties, such as the Shiraz, for instance Pollen grains in various stages of germination are illustrated in Plate II, Fig 3

Emasculation of the Flowers

The normal fertility of the pollen grains having been established, we proceeded to emasculate a large number of Zante currant flower bunches. The operation was carried out as follows:- All open flowers were first carefully removed, and the bunches were then thinned out, so as to retain a few well-scattered flower buds that in the ordinary course of events would open out in a few days' time. With a fine forceps the caps were carefully removed, carrying with them frequently some or all the anthers. Any anthers that remained attached to the flower were subsequently taken off When all the flowers had been emasculated the bunch was then enveloped in a fine gauze bag, specially made for the purpose

At the time that this work was being carried out I had occasion to examine under the microscope at a comparatively high magnifying power the stigma of a vine flower. Much to my surprise I found that it had retained numerous pollen grains that were invisible to the eye, aided by an ordinary magnifying glass, and this in spite of the fact that the flower had been emasculated indoors with even greater care than is possible in the open on the vines. It immediately occurred to me that such an accident might readily reproduce itself in outdoor emasculation experiments. With a view to controlling the latter I therefore had emasculated in exactly the same way bunches of ordinary seeded varieties, namely, Shiraz, Doradilla, and Muscatels. If in such circumstances both currant and ordinary seeded varieties set their fruit, it could not be inferred that the Zantes formed any exception to the general rule and developed their fruit without the intervention of pollen.

EXAMINATION OF OVULES BEFORE AND AFTER FERTILISATION

In the meantime, to the extent that the limited period at our disposal and the pressure of other duties permitted, it was determined to ascertain whether an examination of the ovules before and after assumed fertilisation could throw any light on the problem we had in hand. In this connection exact measurements of a large number of ovules were taken in different stages of development, the results of which are summarised below :—

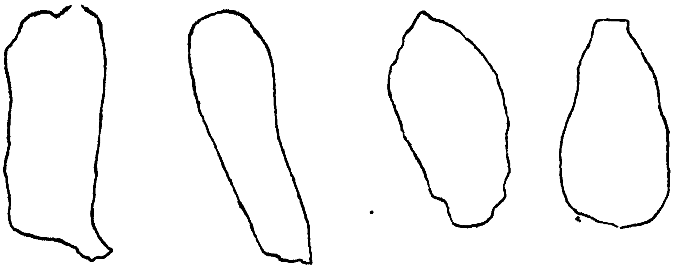
TABLE I

Showing Length and Breadth of Ovules at Various Stages of Development.

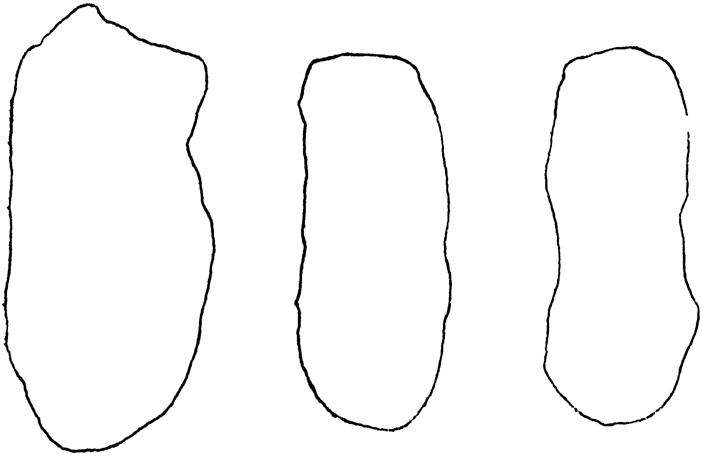
Date		Variety	State of the Flowers and Vine	Dimensions in millimetres	Dimensions in inches	Figures representing relative sizes of Ovules
Nov	11	Zante	From swollen but unexpanded flower bud	0·55 x 0·25	0·022 x 0·010	220
,,	13		,, ,,	0·66 x 0·28	0·026 x 0·011	286
,,	13	,,	,, ,, ,,	0·75 x 0·32	0·030 x 0·013	390
,,	13	,,	,, ,,	0·66 x 0·28	0·026 x 0·011	286
,,	13		,, ,,	0·65 x 0·30	0·026 x 0·012	312
,,	13	,,	,, ,, ,,	0·66 x 0·30	0·026 x 0·012	312
,,	13	,,	,,	0·70 x 0·30	0·028 x 0·012	336
,,	13	,,	,, ,,	0·57 x 0·25	0·023 x 0·010	230
,,	13	,,	,, ,,	0·58 x 0·25	0·023 x 0·010	230
,,	13	,,	,, ,, ,,	0·53 x 0·22	0·021 x 0·009	189
,,	11	,,	From flower after fall of stamens	0·83 x 0·35	0·033 x 0·014	462
,,	13	,,	From flower after fall of stamens, fruit slightly swollen ; vine not rung	0·72 x 0·33	0·029 x 0·013	377
,,	13	,,	,, ,, ,,	0·92 x 0·40	0·037 x 0·016	592
,,	13	,,	,, ,, ,,	0·92 x 0·38	0·037 x 0·015	555
,,	13		From expanded flowers, vine rung	0·88 x 0·35	0·035 x 0·014	490
,,	13	,,	,, ,, ,,	1·00 x 0·43	0·040 x 0·017	680
,,	13	,,	,, ,, ,,	0·92 x 0·35	0·037 x 0·014	518
,,	13	,,	,, ,, ,,	0·77 x 0·32	0·031 x 0·013	403
,,	13	,,	,, ,, ,,	0·83 x 0·33	0·033 x 0·013	429
,,	13	,,	,, ,, ,,	0·83 x 0·33	0·033 x 0·013	429
,,	16	,,	,, ,, ,,	0·85 x 0·38	0·034 x 0·015	510
,,	16	,,	,, ,, ,,	0·92 x 0·38	0·037 x 0·015	555
,,	16	,,	From fruit recently set, vine rung	1·00 x 0·35	0·040 x 0·014	560
,,	16	,,	,, ,, ,,	0·85 x 0·28	0·034 x 0·011	374
,,	16	,,	,, ,, ,,	0·83 x 0·35	0·033 x 0·014	462
,,	16	,,	,, ,, ,,	0·82 x 0·33	0·033 x 0·013	429
,,	16	,,	,, ,, ,,	0·75 x 0·33	0·030 x 0·013	390
,,	16	,,	,, ,, ,,	0·88 x 0·38	0·035 x 0·015	525
,,	16	,,	,, ,, ,,	0·80 x 0·33	0·032 x 0·013	416
,,	16	,,	,, ,, ,,	0·78 x 0·35	0·031 x 0·014	434
,,	16	,,	,, ,, ,,	0·83 x 0·38	0·033 x 0·015	495
,,	16	,,	From less advanced fruit, vine rung	0·75 x 0·35	0·030 x 0·014	420
,,	16	,,	,, ,, ,,	0·68 x 0·33	0·027 x 0·013	351
,,	16	,,	,, ,, ,,	0·75 x 0·33	0·030 x 0·013	390
,,	16	,,	,, ,, ,,	0·83 x 0·33	0·033 x 0·013	429
,,	16	,,	,, ,, ,,	0·83 x 0·38	0·033 x 0·015	495

Date	Variety	State of the Flowers and Vine	Dimensions in millimetres	Dimensions in inches	Figures representing relative sizes of Ovules.
Nov 16	Zante	From fruit recently set, vine not rung	0.83 x 0.33	0.033 x 0.013	429
,, 16	,,	,, ,, ,,	0.90 x 0.32	0.036 x 0.013	468
,, 16	,,	,, ,, ,,	0.80 x 0.38	0.032 x 0.015	480
,, 16	,,	,, ,, ,,	0.75 x 0.28	0.030 x 0.011	330
,, 16	,,	,, ,, ,,	0.83 x 0.33	0.033 x 0.013	429
,, 16	,,	,, ,, ,,	0.82 x 0.37	0.033 x 0.015	495
,, 16	,,	,, ,, ,,	0.75 x 0.28	0.030 x 0.011	330
,, 16	,,	,, ,, ,,	0.76 x 0.32	0.030 x 0.013	390
,, 16	,,	,, ,, ,,	0.70 x 0.32	0.028 x 0.013	364
,, 16	,,	,, ,, ,,	0.82 x 0.33	0.033 x 0.013	429
,, 21	,,	From more advanced fruit; vine rung	0.71 x 0.33	0.028 x 0.013	364
,, 21	,,	,, ,, ,,	0.67 x 0.25	0.027 x 0.010	270
,, 21	,,	,, ,, ,,	0.75 x 0.33	0.030 x 0.013	390
,, 21	,,	,, ,, ,,	0.73 x 0.29	0.029 x 0.012	248
,, 21	,,	,, ,, ,,	0.77 x 0.27	0.031 x 0.011	341
,, 21	,,	,, ,, ,,	0.77 x 0.33	0.031 x 0.013	403
,, 21	,,	,, ,, ,,	0.71 x 0.31	0.028 x 0.012	336
,, 21	,,	,, ,, ,,	0.75 x 0.29	0.030 x 0.012	360
,, 21	,,	,, ,, ,,	0.71 x 0.27	0.028 x 0.011	308
,, 21	,,	,, ,, ,,	0.71 x 0.25	0.028 x 0.010	280
,, 21	,,	,, ,, ,,	0.77 x 0.29	0.031 x 0.011	341
,, 21	,,	,, ,, ,,	0.73 x 0.29	0.029 x 0.011	319
,, 21	,,	,, ,, ,,	0.77 x 0.29	0.031 x 0.011	341
,, 21	,,	,, ,, ,,	0.73 x 0.27	0.029 x 0.011	319
,, 21	,,	,, ,, ,,	0.69 x 0.25	0.028 x 0.010	280
,, 21	,,	,, ,, ,,	0.73 x 0.23	0.029 x 0.009	261
,, 13	Doradilla	From swollen but unexpanded flower buds	0.57 x 0.28	0.023 x 0.011	253
,, 13	,,	,, ,, ,,	0.65 x 0.18	0.026 x 0.007	182
,, 13	,,	,, ,, ,,	0.60 x 0.28	0.024 x 0.011	264
,, 16	Shiraz	,, ,, ,,	0.55 x 0.28	0.022 x 0.011	242
,, 16	,,	,, ,, ,,	0.53 x 0.32	0.021 x 0.013	273
,, 16	,,	,, ,, ,,	0.62 x 0.27	0.025 x 0.011	275
,, 16	Doradilla	,, ,, ,,	0.55 x 0.27	0.022 x 0.011	242
,, 16	,,	,, ,, ,,	0.62 x 0.28	0.025 x 0.011	275
,, 16	,,	,, ,, ,,	0.62 x 0.25	0.025 x 0.010	250
,, 16	,,	,, ,, ,,	0.57 x 0.27	0.023 x 0.011	253
,, 16	,,	,, ,, ,,	0.58 x 0.28	0.023 x 0.011	253
,, 16	Muscatel	,, ,, ,,	0.58 x 0.30	0.023 x 0.012	276
,, 16	,,	,, ,, ,,	0.53 x 0.23	0.021 x 0.009	147
,, 16	,,	,, ,, ,,	0.67 x 0.25	0.027 x 0.010	270

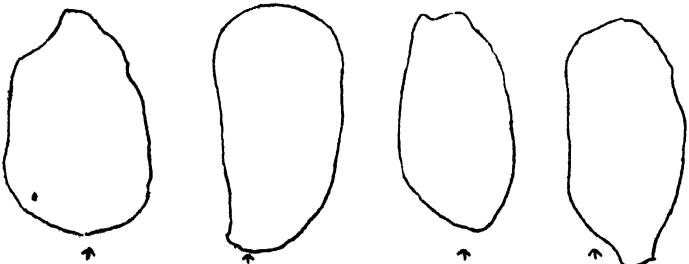
In the table above, the greatest length and greatest breadth of each ovule is represented respectively in decimal parts of a millimetre and decimal parts of an inch. As it was necessary to take into account two dimensions, and to make use of either fractions or decimals in recording them, I have felt that the results would be rendered plainer and more striking by the adoption of a single number, which would represent more graphically either the swelling or the shrinking of the ovules. I have, therefore, added a third column, in which the length, expressed in decimals of an inch, has for each ovule been multiplied by its respective breadth, and the result expressed in plain figures without reference to decimals. The figures given make no pretension to represent the actual surface area of an ovule, but they indicate sufficiently correctly in what proportions these areas vary Thus, an ovule measuring 0.022 x 0.010 is represented in the third column by 220, whilst one measuring 0.037 x 0.016 is represented by 592. Roughly speaking, their respective areas are as 220 is to 592, i.e., the last ovule is over 2½ times the size of the first one In brief, therefore, the size of the ovules may be taken to be represented



ZANTE CURRANT OVULES FROM SWOLLEN BUT
UNEXPANDED BUDS



ZANTE CURRANT OVULES SHORTLY AFTER FALL
OF THE STAMENS (PRESUMABLY FERTILISED)



SHIRAZ OVULES DORADILLA OVULES
FROM SWOLLEN BUT UNEXPANDED BUDS

PLATE III.

Outlines of Ovules of Vines Magnified 70 Times.

proportionally to the figures set against them in the third column of the table.

A careful inspection of this table will show that the ovules swell out and increase in dimensions after the fall of the stamens: that is, after fertilisation may be assumed to have taken place. This growth of the ovules continues for a week to ten days, when a short stationary period is reached, after which they show evident signs of slow shrinking. Unless, therefore, it can be otherwise definitely proved that such phenomena might be realised without the intervention of the pollen, we are bound to conclude that the process of the development of the seedless currant is preceded by the fertilisation of the ovules, which at first expand under its influence, but subsequently abort and disappear. These results would justify the attitude that I have always taken up on this question.

The relative dimensions of the ovules before and after fertilisation are illustrated in outline in Plate III. On the same plate I have reproduced the outlines of the ovules of several seeded varieties. It will be noted that in general the Zante currant ovule is slightly larger than those of other varieties examined.

RESULTS OF THE EMASCULATION OF FLOWERS.

The results of the emasculation of the flower bunches were surprising, though not altogether unforeseen after my earlier examination of the stigmas of the flowers. In every instance in which the flower stalk had not been injured, and just as much on the ordinary seeded varieties as in the seedless Zante, the flowers, although deprived of their stamens, set to fruit perfectly. It may be added that from among the emasculated Zante currant bunches there developed one consisting entirely of seeded berries, whilst on the others occasional "buck currants" were in every case present. If we were to place the same faith in these experiments that Mr. Grasby placed in his, we should find ourselves bound to conclude that with vines in general, both seedless and seeded, pollen was a useless substance, produced in pure waste, and absolutely devoid of any purpose in this world. Our conclusions, I fear, must, however, take a direction quite other. It is evident that the pollen is mature several days before the expansion of the flowers; we succeeded, in fact, in securing the germination of pollen grains taken from unexpanded flowers. Prior to the opening of the flower the stamens are practically in contact with the stigma, and it is apparently exceedingly difficult, if not impossible, to avoid dusting the latter with pollen whilst the former are being removed. Possibly the operation might prove more successful if carried out earlier in the season. Should the flowers fail to set in such conditions it might be argued by the other side that early emasculation hindered their further development. In any case, the burden of proof lies with those who imagine that the general laws of Nature do not hold good in this special case, and whilst, should opportunity arise, I propose reinvestigating this question next season I cannot bind myself down to do so unless something new in the matter is brought forward.

CONCLUSIONS.

The results of the past season's investigations may be summarised as follows:—

1. The pollen of the seedless Zante germinates quite as freely as that of other seeded varieties.
2. The pollen is mature in unexpanded flowers.
3. It is extremely difficult, if not impossible, to avoid leaving pollen on the stigmas of vine flowers whilst emasculating them two or three days prior to their expansion.
4. Experiments in which emasculated flowers set to fruit are, therefore, quite inconclusive as to the alleged absence of fertilisation in the development of seedless fruit
5. The ovules of Zante currants expand after the fall of the stamens, presumably under the influence of fertilisation, within eight to ten days they contract and finally abort.
6. We have been able to discover nothing in the development of the seedless Zante to justify the assumption that it is produced without the intervention of pollen.

ANALYSES OF FERTILISERS.

By W. L. Summers, Inspector of Fertilisers.

The following results of analyses of samples of fertilisers obtained by myself during the past three months are published for general information. In each case the certificate of constituents, or guarantee registered by the vendor, is shown in brackets, thus (36 per cent.), immediately before the results of the analyses.

Up to date of writing relatively small quantities of manure have arrived, owing to the protracted voyages of several vessels. As additional samples are obtained and tested the results will appear in *The Journal*:—

Australasian Implement Company's Shirley Superphosphate (three samples).—Water-soluble phosphate (36 per cent.), 36 per cent., 34.3 per cent., 35.4 per cent., 36.7 per cent.

Elder, Smith & Co's Ceres Superphosphate.—Water-soluble phosphate (36 per cent.), 38.7 per cent., 39.3 per cent.

Elder, Smith & Co.'s Lawes' Superphosphate.—Water-soluble phosphate (36 per cent.), 39 per cent., 39.6 per cent., 37.3 per cent., 37.3 per cent., 39.4 per cent.

Norman & Co.'s Superphosphate.—Water-soluble phosphate (35 per cent.), 38.7 per cent.

George Wills & Co.'s United Alkali Company's Superphosphate.—Water-soluble phosphate (36 per cent.), 37.4 per cent., 38.4 per cent.

Adelaide Chemical Works Co.'s Mineral Superphosphate.—Water-soluble phosphate (36 per cent.), 41.9 per cent., 38.5 per cent.

Wallaroo Phosphate Co.'s Superphosphate.—Water-soluble phosphate (36 per cent.), 39.3 per cent., 41.2 per cent.

Clutterbuck Brothers' United Alkali Co.'s Superphosphate (Planet Brand).- Water-soluble phosphate (36 per cent) 37.6 per cent.

Clutterbuck Brothers' Special Superphosphate. Water-soluble phosphate (37 per cent.), 38.7 per cent.

D. & J. Fowler & Co., Limited, Lion Brand Superphosphate. -Water-soluble phosphate (36 per cent.) 43.3 per cent.

D. & J. Fowler & Co., Limited, Lion Brand Superphosphate. Water-soluble phosphate (39 per cent.), 44.3 per cent.

Adelaide Chemical Works Co.'s Bone Superphosphate.—Nitrogen (2.1 per cent.), 1.8 per cent.; water-soluble phosphate (15.2 per cent.), 22.8 per cent.; citrate-soluble phosphate (15.8 per cent.), 12.2 per cent.; acid-soluble phosphate (6.8 per cent.), 4.3 per cent.

Adelaide Chemical Works Co.'s Guano Superphosphate.—Water-soluble phosphate (25 per cent.), 34.4 per cent.; citrate-soluble phosphate (5 per cent.), 1.5 per cent.; acid-soluble phosphate (3 per cent.), not tested.

Adelaide Chemical Works Co.'s Bonedust.—Nitrogen (3.5 per cent.), 3.7 per cent.; acid-soluble phosphate (45 per cent.), 43.4 per cent.

Crompton & Son's Bonedust.—Nitrogen (3.9 per cent.), 3.9 per cent.; acid-soluble phosphate (44.67 per cent.), 45.2 per cent.

Adelaide Chemical Works Co.'s S.A. Super.—Water-soluble phosphate (30 per cent.), 35.6 per cent., 33.8 per cent.; citrate-soluble phosphate (2 per cent.), 1.4 per cent., 3.9 per cent.; acid-soluble phosphate (3 per cent), not tested.

Adelaide Chemical Works Co.'s Guano Super.—Water-soluble phosphate (25 per cent.), 33.8 per cent., 33.7 per cent.; citrate-soluble phosphate (5 per cent.), 2.4 per cent., 3.7 per cent.; acid-soluble phosphate (3 per cent.), not tested.

Adelaide Chemical Works Co.'s Wheat Manure.—Nitrogen (1.05 per cent.), 0.95 per cent.; water-soluble phosphate (28.1 per cent.), 28.8 per cent.; citrate-soluble phosphate (5.9 per cent.), 6.5 per cent.; acid-soluble phosphate (6 per cent.), not tested.

Adelaide Chemical Works Co.'s Hay Manure.—Nitrogen (1 per cent.); 0.65 per cent.; water-soluble phosphate (30 per cent.), 31.1 per cent.; citrate-soluble phosphate (2 per cent.), 4.9 per cent.; acid-soluble phosphate (3 per cent.), not tested.

RUST-RESISTANT WHEATS.

By W. L. Summers, Inspector of Fertilisers.

The prevalence of red rust in the wheat crops last year again caused farmers to give much attention to the growing of wheats which resist the attacks of this disease. In nearly every district liable to rust fairly large areas of such wheats are grown, and this year many striking examples have been afforded of the practical immunity of these wheats from damage by rust. In view of the heavy losses experienced in that district, the Denial Bay Branch of the Bureau asked the Department to prepare a descriptive list of the best rust-resistant wheats. This suggestion being a very valuable one, we sent circulars to each Branch in the wheatgrowing areas asking for reports on such wheats as had proved resistant in the respective districts. A request was also made through *The Journal* to individual members to assist in obtaining the desired information. Our circular has not met with the response that we were justified in anticipating: still sufficient returns have been received to enable us, with our knowledge of the varieties grown in most localities, to prepare a short descriptive list of the best varieties now grown here. All those mentioned are grown to a fairly large extent, in addition, there are quite a number which are of but recent origin.

Early Maturing Varieties.

Baroota Wonder. A very early wheat, selected and distributed by Mr. G. Crittenden, of Telowie. A good, all-round wheat, yields well, grain plump and good; straw strong, a good hay wheat. Is probably a selection from Ward's Prolific, but superior in every way, is grown largely around Baroota, Telowie, and Crystal Brook. Probably more rust-escaping than rust-resisting

Carmichael's Eclipse.—Raised by Carmichael Brothers, of Telowie, and grown very largely about Telowie, Pirie, Wandearah, Gladstone, and to a fair extent southwards. Straw rather short, strong, but wiry, and of little value for hay. Head short, plump, brown, close chaff, and by some classed as difficult to thresh. Grain short, plump, heavy, but rather dark, an early maturing and splendid yielding wheat.

Gluyas.—Selected some years ago by Messrs. Gluyas, of Telowie. A very early wheat, head generally long, chaff rather dark, grain somewhat difficult to thrash. Straw thin, clean, but brittle, goes down badly in heavy weather. Grain long, plump, heavy, by some classed as "rather flinty," but is generally accepted as a fairly good milling wheat. Heavy yielder, exceedingly resistant to rust. Yields heavily as hay, and in dirty land is valuable on account of its earliness; generally not considered a good hay wheat. This wheat is probably more popular just now in the earlier districts subject to rust than any other variety. About Baroota, Telowie, Pirie, Wandearah, Crystal Brook, Gladstone, and down towards the northern part of the Peninsula it is very largely grown. In the latter districts it is not grown so extensively, and owing to the weakness of the straw is not popular.

Petatz Surprise.—An early wheat, selected by Mr. G. Petatz, of Caltowie, and grown extensively around Caltowie, and towards Gladstone, near Koolunga, Paskeville, and other parts north of the Peninsula. Straw thin and weak, goes down badly in heavy weather, heads small, grain small, but plump and heavy A very good yielder in suitable localities, and a fair hay wheat. Probably more rust-escaping than rust-resisting. Is not suitable to the later districts.

Rerraf.—An early wheat, raised by Mr. W. Farrer, of New South Wales, and distributed here a few years ago., Tall, but fairly strong white straw; heads fairly large, grain good, very hard to thrash, yields well in certain localities; not of much value for hay.

Wiltunga Wonder.—A fairly early wheat, selected by Mr. J. St. J. Mudge, of Wiltunga, about eight years ago. Tall straw, rather weak, but a good hay wheat. Grain of good quality; a good yielding variety. Not grown very extensively, except in district where it was raised.

Early Mid-season Wheats.

Leak's Rust-proof.—A selection of Mr. D. Leak's, which was for a good many years a favourite variety, but has now been supplanted by varieties considered superior. An early, mid-season wheat, good grain, heavy yielder, white straw, heads slightly bearded. More rust-escaping than rust-resisting.

Leak's Improved.—A later selection of Mr. Leak's. An early, mid-season variety, tall grower, small head, nice plump grain, very good yielder. An improvement on Leak's Rustproof, but generally similar in appearance. Not grown very extensively.

Milne's White.—Raised by Mr. A. Milne, of Lower Broughton, and grown fairly extensively of late years around Pirie and Wandearah. Medium early wheat, long square head, plump white grain, heavy yielder, nice stout straw, and a good hay wheat.

Ward's Prolific.—One of the first resistant wheats raised in South Australia, a selection made by Mr. Ward, of Nelshaby. For some years it was very largely grown, but owing to the dark, hard nature of the grain it met with strong opposition from the millers, and has consequently gone out of favour. It is a medium early wheat and a good yielder, the straw and chaff being dark brown.

MID-SEASON WHEATS.

Budd's Rust-resistant.—A selection of Mr. A. M. Budd, of Napperby. A mid-season wheat, stout, dark straw; long, thin, rather dark grain; good yielder, and very resistant to rust. Yields a heavy crop of hay. A wheat known as Budd's Rustproof is also grown in Pirie and Mundoora districts. Whether it is the same or not I am not certain, but I believe the latter wheat is earlier and carries a shorter head, with lighter-coloured grain.

Gamma.—A selection made by Mr. W. H. Hawke, of Tiparra, and grown fairly extensively in the north of the Peninsula, also meeting with favour in other districts. Straw strong, but rather short, only a fair hay wheat; grain bright, small, but plump and well held, a good milling wheat, yields well, and is very resistant to rust.

Majestic.—One of Mr. R. Marshall's wheats. A splendid, all round wheat, regarded by the raiser as far superior to his No. 3. A tall, nearly solid-strawed wheat, heavy yielder both for grain or hay, grain very good A good stooling wheat, and as nearly rustproof as any wheat grown here. Is slightly earlier than Marshall's No. 3 under favourable conditions; but, owing to its stooling habit, probably requires a little more moisture to bring it to maturity.

Marshall's No. 3.- One of Mr. R. Marshall's early selections. A mid-season wheat, good strong straw, long heads, close chaff, long, plump, heavy grain, of fair milling quality. One of the best rust-resistant wheats grown, a good yielder, and fair to good hay wheat, though in some districts classed as "coarse." This wheat is grown to a greater extent than any other rust-resistant variety in the Lower North and South, and has few, if any, superiors as an all-round wheat. It is not suited to the early districts, owing to its lateness in ripening, and a caution is necessary to those in the early districts who have only tried it this year against placing too much reliance on its behaviour during the present season In Baroota, Pirie, Wandearah, and similar districts it is two or three weeks too late in maturing.

Gallant. -A mid-season wheat, raised by Mr. Marshall a few years ago. Very resistant to rust, and a good yielding wheat. Straw tall and nearly solid; head compact; grain fairly large and good. A splendid wheat for hay.

Silver King.—Another of Mr. Marshall's mid-season wheats, and regarded by that gentleman as superior to either No. 3 or Majestic, though not so well known. A very heavy yielding wheat, heads large, grain plump and of good quality. Stools well, straw nearly white, very tall, but strong. A splendid hay wheat.

Phillis Marvel.- This wheat was, I believe, distributed by Mr. G. Phillis, of near Snowtown, but Mr. R. Marshall claims that it is his No. 4 selection, a small quantity of seed of which he gave to Mr. Phillis. As the wheat is, however, generally known as Phillis Marvel, it will be referred to under that name. This is a mid-season variety, with bright, strong straw, long, well-developed head; large, good grain: a good yielder and good hay wheat This variety is grown mainly between Kadina and Port Broughton.

South Australian Wonder.—A mid-season wheat raised by Mr. A. B. Robin, of Nuriootpa, some twelve years ago, but is not grown to any considerable extent. Straw rather weak; grain fair and plump, fairly resistant to rust, but not a very heavy yielder.

In addition to the above there are a number of resisting varieties which are practically unknown except in the districts in which they were raised. Some of these will probably prove very valuable, but until more largely grown

and proved cannot be dealt with in our list. Amongst the newer wheats now placed on the market Mr. R. Marshall very strongly recommends Comeback for early districts and Jonathan for later localities. Both are strong-floured wheats, good yielders, and very resistant to rust.

RUST-ESCAPING WHEATS.

Besides the wheats which resist the attacks of rust there are quite a number of varieties which, owing to their earliness, usually escape damage. Amongst these the following might be mentioned:—Grey's Early, Bartlett's Crossbred, Neumann's Early, Early Para, Smart's Early, Allora Spring, Steinwedel, Baker's Early, Ranjit, Boomerang, and Waddy. In view of the fact that we have resistant varieties suitable to nearly all districts, these rust-escaping wheats are of less value than they were a few years ago.

SELECTION OF VARIETIES FOR CERTAIN DISTRICTS

The Department was asked to indicate also the best resistant wheats for the respective districts. This, however, we can scarcely attempt at the present season. Probably the following general outline will be sufficient

A. *Very Early Districts.*—Baroota Wonder, Gluyas, Carmichael's Eclipse, Petatz Surprise, Rerraf, and Wiltunga Wonder.

B. *Mid-early Districts* (i.e., where Purple Straw is not quite early enough) All the above, Milne's White, Comeback, and Budd's

C. *Medium and Late Districts* (i.e. where Purple Straw does well) – Budd's, Gamma, Marshall's No. 3, Phillis Marvel, Gallant, Majestic, Jonathan, Silver King. The last four require a little more moisture than No. 3 to secure the best results.

It will, of course, be understood that the above is merely suggestive. With more experience and further information probably some excisions from it will be necessary and a good many additions will be justified Every care has been taken to obtain the correct history and description of the wheats, and any further information on these points will be welcome

BARLEY SMUT EXPERIMENT.

By J. D. TOWAR, PRINCIPAL AGRICULTURAL COLLEGE

This experiment, described on page 670 of the June, 1903, *Journal of Agriculture*, had in view the object of testing the efficiency of the various methods of treating the seed to destroy the smut fungus.

The seed employed was very badly smutted A bagful, four bushels, was divided in four equal parts, and treated as follows --

- **No 1. Pickled in 2 per cent. bluestone solution.**
- **No. 2 Treated with formalin solution, 1 lb. formalin to 25 gallons of water.**
- **No. 3. Treated with patent smut dressing, presented by Messrs E. and W. Hackett, Adelaide**
- **No. 4. No treatment.**

Each part was sown on well-prepared and fertilised land on May 8. The area devoted to each plot, with the exception of the No. 4, was half an acre. Owing to the fact that the treatments swelled the seeds, Nos. 1, 2, and 3 ran more slowly through the drills and covered more ground The results are shown in the following table

Table Showing Results from Barley Smut Experiment.

Plots.	Treatment	Heads in 55 feet of Drill Row			Yield per Acre.
		Perfect Heads.	Smutted Heads.	Percent of Smutted Heads	
					bushels.
No. 1	Bluestone treatment	796	19	2·4	40·08
No. 2	Formalin treatment	910	7	0·8	39·24
No 3	Patent treatment ..	1,037	0	0·0	42·93
No. 4	No treatment .	850	82	9·6	41·82

To determine the extent of the attack of the smut, ten different counts were made in various parts of each plot, noting the number of perfect and smutted stalks at each place in 5½ ft. of drill row. The sum of these ten countings furnish the figures of the first three columns in the table above. The yield of grain per acre was secured by cutting with the binder, threshing, and weighing the crop. The higher yield per acre of the untreated grain is due in part to the fact that the germination was not injured by any treatment, and that the area was seeded more thickly than the others. It is a singular fact that the grain, even of the untreated plot, was not so badly smutted as the original seed.

FERTILISERS FOR WHEAT CROPS.

By W. L. Summers, Inspector of Fertilisers.

During 1903 various Branches of the Agricultural Bureau were supplied by the Department of Agriculture with manures for experimental purposes, and the following reports have been received from the gentlemen carrying out the experiments. In calculating the financial aspects of these tests the Adelaide price of manure is taken, and the wheat valued at 2s. 9d. per bushel.

Carrieton.—Mr. W. J. Gleeson.

This experiment was mainly directed to testing the effect of light dressings of superphosphate on the different soils typical of these dry areas. The land selected by Mr. Gleeson was bluebush land, white, hard red, and brown soil, with some patches of clay and black loam. Portions were sown about middle of March, April, and May respectively. The season turned out unfavourable Nice rains fell in April, but the following months were very dry, and the wheat blighted off several times owing to the hot, dry weather. September was wet, and portion of the crop suffered severely from hail. The total rainfall from seeding to harvest was just 7 in. Results generally showed a return of two bushels more per acre from the manured than from unmanured land In the white soil there was very little difference noticeable: in the black soil practically none; but on the red land there was a great improvement.

In conjunction with these tests Mr. Gleeson used a quantity of manure purchased by himself In all he manured 260 acres of crop. Nothing of any particular value can be gained from the results of this experiment, but Mr. Gleeson expresses himself as confident that on the red land, under better conditions, the manure will pay to use.

Whyte-Yarcowie.—Mr. G. R. Mudge.

These experiments were carried out on a sandy loam soil, cropped in 1900, and fallowed for 1903 crop. The land had never previously been manured, and was in good order and fairly moist when sown, in middle of April, with 45 lb. per acre Farmer's Friend wheat. Good rains fell during the early part of the winter, but July and August were dry and tried the crops. The total fall from seeding to harvest was 15.30 in. The following returns were obtained:—

No. of Plot.	Manure Applied.	Yield per Acre.		Increase per Acre due to Manure.		Cost of Manure per Acre.		Profit per Acre from use of Manure	
		bush.	lbs.	bush.	lbs.	s.	d.	s.	d.
1	60 lbs. Mineral Super ..	16	40	5	39	2	4	13	2
2	100 lbs. Mineral Super ...	20	55	9	54	3	9	23	6
3	140 lbs. Mineral Super ...	20	34	9	33	5	4	20	11
4	100 lbs Wheat Manure ...	20	37	9	36	4	6	21	11
5	No Manure	11	1	—		—		—	

It will be seen, therefore, that while the light dressing of super gave the handsome profit of 13s. 4d. per acre, the heavier dressings gave still better returns. Practically, plots 2, 3, and 4 gave the same return, but the lesser expense on plot 2 makes the 100 ℔. dressing the most profitable While the heavier dressing increases the growth of straw somewhat, it also appears to render the crop more susceptible to the influence of drying winds late in spring, when the supply of moisture begins to fail The wheat manure differs from mineral super inasmuch as it contains a little over 1 per cent. of nitrogen, some potash, and, while the total phosphate is about the same, the percentage soluble in water is about 26 per cent., as against 36 per cent. in the mineral super. As will be seen from the results, the mineral super gave a profit of 1s. 7d. more than the wheat manure

SWAN REACH. MR. R. J. HARRIS.

Land varying from stony grey soil at one end to deep sand at the other was used, the plots being forty chains in length, taking in the different kinds of soil. The land was under crop last season, and had not previously been manured. A good tilth was secured, but the soil was very dry when sown about middle of May. Dart's Imperial wheat was used. The rainfall was above the average, and, with the exception of a dry spell in the early part of the season, weather conditions were favourable throughout the growing period. The following are the results:—

No of Plot.	Manure Applied.	Yield per Acre		Increase per Acre due to Manure.		Cost of Manure per Acre.		Profit per Acre from use of Manure.	
		bush	lbs	bush	lbs	s	d	s.	d,
	100 lbs Mineral Super	15	38	7	2	3	9	15	7
	60 lbs. Mineral Super	13	35	4	59	2	4	11	5
	60 lbs. Guano Super	11	0	2	24	2	3	4	4
	44 lbs Concentrated Super	13	24	4	48	5	0	8	2
	No Manure	8	36	—		—		—	

Here the ordinary mineral super has done much better than either guano super or concentrated super, containing water-soluble phosphate equivalent to what is contained in 100 ℔. ordinary super. The 100 ℔ dressing of mineral super again gives the most profitable result. The return from the unmanured plot is decidedly above the average from stubble land in this locality. Mr. Harris states that in his opinion the application of 50 ℔. super to crops sown about the beginning of April will give quite as good a return as will 100 ℔. applied late in May.

SWAN REACH.—MR. J. L. BAKER.

Mr. J. L. Baker reports as follows on some experiments carried out by himself. Soil was sandy loam, with patches of marl and outcrops of limestone. It had been under crop the three previous years, was ploughed up in April, and sown on April 23, the ground being fairly moist, nearly a third of an inch of rain falling the previous day. The season was fairly wet until July, but only one and a half inches fell in July and August, after which there was more rain than usual. From seedtime to harvest 8.72 in. of rain was recorded, 27 ℔, of Baroota Wonder wheat per acre was sown on each plot. The harvest gave the following returns:-

No. of Plot.	Manure Applied.	Yield per Acre.		Increase per Acre due to Manure.		Cost of Manure per Acre.		Profit per Acre from use of Manure.	
		bush	lbs.	bush	lbs	s.	d	s.	d.
1	56 lbs. Complete Manure	15	50	3	43	2	6	7	9
2	56 lbs. Super B ..	15	33	3	26	2	2	7	3
3	No Manure ..	12	7	—		—		—	
4	56 lbs. Wheat Manure	15	34	3	27	2	6	7	0

These results are interesting in that they again demonstrate how little effect small dressings of nitrogen have in our dry areas. Both complete manure and wheat manure contain some nitrogen and a very little potash, but there is very little difference in the results. The crop from the unmanured land is very good for this district, and considerably above the average. The returns generally indicate the possibilities of the land east of the Murray for wheat-growing under proper management. Mr. Baker states that the manures had really more effect than the wheat yields show, as, owing to the stronger growth on these plots, the heavy rains late in the season caused the plant to go down, and made clean thrashing very difficult.

RHINE VILLA.—MR. J. W. VIGAR.

Heavy red sand, last in crop in 1899, was used for this experiment. The land had never been manured before; it was fine and loose after summer cultivation, and was sown during the second week in April, 37 lb. of Purple Straw wheat being drilled in. The early part of the season was wet, but July was very dry, and the wheat suffered considerably. The total rain from seedtime to harvest was just ten inches, of which three inches fell in November, but was of no use to the crop.

No. of Plot.	Manure Applied.	Yield per Acre.		Increase per Acre due to Manure.		Cost of Manure per Acre.		Profit per Acre from use of Manure.	
		bush.	lbs.	bush.	lbs.	s.	d	s	d
1	60 lbs. Mineral Super .	20	49	5	39	2	4	13	2
2	100 lbs. Mineral Super	20	27	5	17	3	9	10	9
3	100 lbs. Reliance Phosphate	20	18	5	8	3	10	10	3
4	100 lbs. Phosphate Powder	20	55	5	45	3	3	12	7
5	100 lbs. Thomas Phosphate	20	17	5	7	3	3	10	10
6	350 lbs. Quicklime	19	10	4	0	—		—	
7	No Manure	15	10	—		—		-	

As Mr. Vigar had previously obtained good returns from Thomas phosphate on this heavy, red sand, the object of the experiment was to test whether the two manures containing phosphate in somewhat similar form would give equally as good results, and also what effect a light dressing of quicklime would have. The Reliance phosphate contained 20 per cent. citrate-soluble phosphate and 9 per cent acid-soluble phosphate, and cost £4 5s. per ton. Thomas phosphate contained about 22 per cent citrate-soluble phosphate and 15 per cent acid-soluble phosphate, and cost £3 12s 6d. per ton. The Phosphate powder is a local manufacture, made to take the place of Thomas phosphate, and contained about 30 per cent water-soluble phosphate and 3 per cent. citrate-soluble phosphate. The results from the manured plots so closely approximate that it is not possible to draw any conclusions as to the merits of these different forms of phosphate, although Mr. Vigar states that the crop on the super plots came into head ten or twelve days earlier than the others, and were somewhat blighted by hot winds experienced in September, but for which plots 1 and 2 would have yielded a good bit more grain than they did. The later crops, on the other hand, benefited by the unusually cool weather that followed. It will be noticed that the return from the unmanured land is very high for this district, and, while the season was undoubtedly more favourable than usual, the results as a whole indicate that even in a dry district like this wheat can be profitably grown under a proper system of cultivation.

RHINE VILLA.—MR. G. A. PAYNE, SEN.

These experiments were carried out on white sandy land, last cropped in 1897 and fallowed in 1902. They were intended as a corollary to Mr. Vigar's tests on heavy land nearer the hills, and where the rainfall is probably somewhat heavier. On plots 1 and 2, 40 lb. of seed, and on plot 3, 30 lb. of seed per acre were sown on April 15 and 16. The soil was dry at seeding, but nice rain fell the following week About 10 in. of rain fell between seedtime and harvest, but 3 in of this came in November, and probably did more harm than good to these crops The following are the results

Plot manured with 1 cwt Thomas phosphate gave a return of 8 bushels 37 lb per acre

Plot manured with 1 cwt Phosphate powder gave a return of 16 bushels per acre

Plot manured with 56 lb Phosphate powder gave a return of 11 bushels 36 lb per acre

It is usually recommended to use Thomas phosphate on soils deficient in lime, and we propose to have this soil analysed in order to ascertain whether these white sands so characteristic of the district are deficient in lime It will be seen that on the lighter soil the Thomas phosphate gives barely half the return that the equal quantity of Phosphate powder gave and 2 bushels 59 lbs less than the yield from plot manured with 56 lbs Phosphate powder Mr Payne states that the rest of his crop was manured with 56 lbs per acre of mineral super, seed being drilled in from April 16 to end of June, and this averaged 10 bushels to 14 bushels A small area broadcasted without manure late in the season gave only 3 bushels per acre Mr Payne reports rust barely noticeable, and a splendid sample obtained from the plots receiving 1 cwt of manure per acre two different buyers gave the weight as 67 lbs per bushel Mr Payne states that these plots as well as those on Mr Vigar's farm have been watched with much interest by the neighbouring farmers, and will do a lot of good, as it has been exceedingly difficult to get the farmers in this district to abandon the old methods and notwithstanding the low annual rainfall he is convinced that with early fallowing the judicious selection of early maturing wheats, and the use of manures this district will become a great wheatgrowing centre

MARRABEL —MR G BENGER

Red land, over clay subsoil fallowed August, 1902 cultivated and rolled in spring, and again cultivated before seeding This land has responded favourably to the application of Thomas phosphate, and the object of the experiment was to test the value of the other two manures compared with Thomas phosphate Purple Straw wheat was sown at the rate of 60 lb per acre, and unfortunately for our experiment was very badly affected by rust Ninety pounds per acre of each manure was used and the returns were From plot manured with Phosphate powder 13 bushels 9 lb per acre with Reliance phosphate, 13 bushels 7 lb with Thomas phosphate 12 bushels 20 lb The grain only weighed 56 lb per bushel Had the crop been cut for hay, Mr Benger states it would have yielded fully 2 tons per acre Although no conclusion can be arrived at from the yields alone Mr Benger is of opinion that the Phosphate powder would have shown to best advantage but for the rust

WILLUNGA MR W J BLACKER

This experiment was carried out with a similar object to that on Mr Benger's farm, but results were equally unsatisfactory, owing to the vagaries of the weather One and a half bushels per acre of Chevalier barley was sown on fallow land that had been out of cultivation for ten years and a splendid crop was produced but heavy winds knocked out a lot of grain and also broke down the crop in patches Sparrows and starlings also proved very destructive, and consequently the plots were not harvested separately The yield of the whole paddock was about 30 bushels per acre

NARACOORTE —MR S H SCHINCKEL

Two years ago Mr Schinckel received from the Department various manures for experimental purposes Owing to the very unfavourable nature of the season the plots were a complete failure from an educational point of view Mr Schinckel determined, therefore, to undertake the experiments again at his own expense, and has furnished me with a report of the results The land used for the tests last year was a heavy, black soil which was ploughed up early in January, reploughed in April, and well worked Gallant wheat was sown on each plot on April 21 and 22 Good seasonable weather resulted in a rapid growth of the wheat, and sheep had to be put on to feed it down. The wheat was quite free from rust. The crops were cut for hay and carefully weighed, with the following results:—

No. of Plot.	Manure Applied.	Yield per Acre of Hay.			Increase per Acre over Unmanured Plot.			Cost of Manure per Acre.		Profit per Acre from use of Manure.		
		tons	cwt.	qrs.	tons	cwt.	qrs.	s.	d.	£	s.	d.
1	112 lbs. Mineral Super .	3	4	2½	1	17	1½	4	3	2	11	10
2	140 lbs Mineral Super . .	3	14	0	2	6	3	5	4	3	4	10
3	112 lbs. Mineral Super and 56 lbs. Nitrate Soda	3	18	2	2	11	1	10	9	3	6	2
4	112 lbs. Phosphate Powder	3	15	0½	2	7	3½	3	8	3	8	2
5	112 lbs. Wheat Manure ...	3	10	1½	2	3	0½	4	8	3	0	0
6	112 lbs. Bone Super .	3	8	2½	2	1	1½	5	9	2	16	4
7	112 lbs. Guano Super .	3	6	2	1	19	1	4	0	2	14	11
8	112 lbs Thomas Phosphate	2	1	1	0	14	0	3	8	0	17	4
9	No Manure . .	1	7	1		—		—			—	

The cost of the manure is Adelaide price, the profit is determined on a basis of 30s. per ton for hay.

Needless to say, the above results are very profitable, and demonstrate the value of manures in the South-East. It will be seen that while the heaviest yield, as was to be expected, came from Plot 3, which was topdressed with half-cwt. of nitrate of soda in addition to receiving 1 cwt. of super, the greatest profit came from Plot 4, receiving 1 cwt. of Phosphate powder. This manure is practically a mineral super, treated in such a way that there is no "free acid" left in it; the process reduces the percentage of water-soluble phosphate from 37 per cent. to 30 per cent. Comparing Plots 1 and 2, it will be noted that the heavier dressing of mineral super is by far the more profitable. Both wheat manure and bone super, however, give better results than the same quantity of mineral super. The former carries about 1 per cent. nitrogen, the latter about 2 per cent., but the percentage of water-soluble phosphate was higher in the wheat manure With a good rainfall, and a strong black soil, I expected the bone super to make a relatively better showing. Guano super occupies a better position than mineral super, while Thomas phosphate gives the poorest return and the least profit of any of the manured plots. Experience has proved this manure to be quite unsuitable to most of our wheat growing districts; but under the conditions prevailing at Naracoorte a much better result was expected.

NITRATE OF SODA AS A TOPDRESSING FOR HAY CROPS.

With a view to testing the value of a topdressing of nitrate of soda for hay crops in the moister districts of the State, arrangements were made to carry out experiments at Clare, Meadows, Reynella, and Port Elliot. In each case there were four plots of five acres each; each plot was to be manured with 1 cwt. of mineral super per acre in the ordinary way. Plot No. 1 was also to receive 84 lbs. of nitrate of soda as a topdressing at the end of July; No 2, 84 lbs. of nitrate about the end of August; and No. 3, 42 lbs. at end of July, and a second dressing of 42 lbs. about end of August.

CLARE.—MR. T. F. PINK.

Land mostly red loam, with strip of limestone soil running through each plot. The plots sloped each way from the top of a slight elevation. The land had been under cultivation for a good many years. In 1902 it carried 2 tons of hay per acre, was afterwards summer fallowed, and was twice scarified and twice harrowed before being sown. A crop of stinkwort about 15 inches in height was ploughed under when the land was fallowed; the after-working brought this to the surface, necessitating its being burnt. Seventy-five lbs. Smart's Pioneer Purple Straw wheat were drilled in with 1 cwt. mineral super per acre early in April, and the land afterwards harrowed. The results were very disappointing. Plot 1 yielded 1 ton 2 2-5 cwt. per acre; Plot 2, 1 ton 4¼ cwt. per acre; Plot 3, 1 ton 4 1-5 cwt. per acre, Plot 4, 18 cwt. per acre. While the increased returns about repay the cost of the manure, they are not likely to induce the grower to use nitrate for his crops. Certainly the very poor return from Plot 4 indicates that a different system of treatment of the soil was necessary. Mr. Pink states that fallowed land alongside, manured with 1 cwt. per acre of super, yielded 2 tons of hay per acre. The object in view in applying the nitrate to summer fallowed land was, of course, to ascertain whether satisfactory returns could be secured from such land with the aid of nitrogen and phosphates, instead of leaving it out of cultivation for a year. Considering the poor yield from Plot 4 in the face of a favourable season, we must admit that the tests have not helped to solve this point.

Port Elliot.—Mr. W. W. Hargreaves.

Soil, light loamy; under oats for three years previously; ploughed in May, and well worked; 1½ bushels of oats and 100 lbs. bone super sown during the first week in June. Here, again, the returns were not satisfactory; in fact, they could hardly be expected under the conditions outlined. Plot No. 1 yielded 19¼ cwt. of hay per acre; Plot No. 2, 17 cwt. per acre; Plot No. 3, 15¾ cwt. per acre; Plot No. 4, 15 cwt. per acre. The very poor yield from Plot 4 is sufficient indication that the treatment given to the soil was not exactly what it should have been.

Meadows.—Mr. W. Pearson.

Mr. Pearson, who has used light dressings of nitrate of soda for his hay crops for several years, reports that, owing to the very wet season, the nitrate was applied too early, and doubtless was carried out of reach of the roots when most needed. The condition of the crop was so unsatisfactory, owing to the cold and wet, that it was decided not to harvest the plots separately, Mr. Pearson being of opinion that the returns would not in any way indicate the value of a topdressing of nitrates at the right season. He considers it useless to apply it before the end of September, as with the heavy rain usually experienced in his district throughout the winter there was too much risk of the soluble nitrogen being washed out of reach of the plants.

SOIL TEST EXPERIMENT.

By J. D. Towar, Principal Agricultural College.

This experiment, outlined in the June, 1903, *Journal of Agriculture;* had for its sole object the determination of the manurial wants of the soil. On the principle that if a manurial element is lacking in a soil the application of that element as a fertiliser will show a marked increased yield, manures containing respectively the elements, nitrogen, phosphoric acid, and potash, were employed, and applied singly in plots 2 to 5, in the table below, in combinations of two elements in plots 7 to 11, and in the combination of all three in plot 13.

As sources of these elements the following manures were employed in the test:—

Nitrate of Soda.—Known also as Chilian saltpetre, valuable as a manure on account of its high percentage of nitrogen, the commercial article containing about 16 per cent. pure nitrogen.

Sulphate of Ammonia.—Valuable only for its nitrogen, containing about 20 per cent. of that element.

Either of the above materials would have anwered for the experiment as a source of nitrogen. The two were used, however, to secure a comparison of the nitrate with the ammonia form of that element. As the nitrate is the more available form of the two, equal quantities of each were applied on the assumption that the greater readiness with which the nitrate would be taken up by the growing plants would compensate for the larger quantity of nitrogen in the sulphate of ammonia. As the ferment which converts the ammonia into nitric acid acts quickly in a warm soil, it is more than likely that the sulphate of ammonia enjoyed a slight advantage over the nitrate of soda plots.

Mineral Super —One of the dissolved mineral phosphates was used, the mineral phosphate being selected on account of absence of other manurial elements in it A bone phosphate would probably have contained some nitrogen

Muriate of Potash – This product of the German mines is a highly concentrated form of potash containing about 60 per cent of potassium oxide, but no other essential manurial element

The area selected for this experiment was located in the south-western portion of field No 6, the greater part of which is fairly rich soil Being near the farm stables, it has quite likely received frequent and irregular applications of farmyard manure This together with the fact that the field has been for several years under crop and liberally manured may account for the somewhat high yield of the unmanured plots and the very slight increase in yield of the highly manured plots over those unmanured or those only lightly treated

The manures were applied broadcast and harrowed in immediately before the grain was drilled King's Early wheat was sown on May 20 and throughout the plots received uniform treatment with the exception of the manuring as shown in the table below The plots were a quarter of an acre each in size yet, to simplify the records, the yields and other figures in the table of results are calculated on the basis of acre plots

The table below gives the quantities of manure applied to the several plots and their respective yields per acre –

Table Showing Results of Soil Test Experiment 1904

No of Plot	Fertilisers Applied	Total per Acre	Yield per Acre			
			Unthreshed Crop or Hay	Grain		Percentage yield compared with average of No Manure Plots fixed at 100 per cent
		lbs	lbs	bus	lbs	
1	No Manure	—	3,560	19	48	100
2	Nitrate of Soda	56	3 580	19	20	109
3	Sulphate of Ammonia	56	3 600	20	4	113
4	Mineral Super	168	3 880	21	44	123
5	Muriate of Potash	56	3 440	19	44	112
6	No Manure		3,160	17	44	100
7	56 lbs Nitrate of Soda 168 lbs. Mineral Super	224	4,080	22	28	127
8	56 lbs Sulphate of Ammonia 168 lbs Mineral Super	224	3,800	23	28	133
9	56 lbs Muriate of Potash 168 lbs Mineral Super	224	3,800	21	32	122
10	56 lbs Nitrate of Soda 56 lbs Muriate of Potash	112	3,360	19	20	109
11	56 lbs Sulphate of Ammonia 56 lbs. Muriate of Potash	112	3 700	20	4	113
12	No Manure	—	3,680	22	12	100
13	56 lbs Nitrate of Soda 168 lbs Mineral Super 56 lbs Muriate of Potash	280	3,880	23	4	130
14	Commercial Manure	224	4,000	24	28	138
15	112 lbs. Nitrate of Soda 112 lbs Mineral Super	224	4,120	22	44	129
16	56 lbs Nitrate of Soda 224 lbs. Mineral Super	280	4,140	23	32	133
17	Mineral Super	224	3,800	20	28	116
18	No Manure	—	2,360	11	0	100
—	Average No Manure Plots	—	3,190	17	41	100

Even with these small plots—¼-acre each, 20 rods x 2 rods, with 3-ft. paths between—the variation in the natural fertility of the land is quite noticeable, as shown by the widely varying yields of the unmanured plots. Plot 12 was favourably located, being in a slight sag, while No. 18 was damaged by teams turning on it when harrowing the adjoining land. Considering these two points, it is quite fair to take the average of the unmanured plots as a standard for determining the benefits derived from the various applications, and the relative yield from the manures in comparison with each other.

The last column of the table is a percentage comparison, calculated from the average of the unmanured plots, 17 bushels 41 lb. being reckoned as a 100 per cent. yield. Using the figures of the percentage column, and taking up the materials in the order applied, we find:—

Nitrate of Soda.

On plot 2 this manure, applied alone, gave a 9 per cent. increase over the average unmanured plots.

On plot 7, with mineral super, it increases the yield over plot 4, where mineral super was applied alone, by 4 per cent.

On plot 10, with muriate of potash, it decreased the yield below plot 5, where muriate of potash was applied alone, by 3 per cent.

On plot 13, with mineral super and muriate of potash, it increases the yield over plot 9, where these materials were applied without the nitrate, by 8 per cent.

On plot 16, where 56 lb per acre is added to the mineral super application of No. 17, there is a 17 per cent. greater yield.

Sulphate of Ammonia.

This material, applied on plot 3, increased the yield over the average of the unmanured plots by 13 per cent.

On plot 8, with mineral super, it increased the yield over plot 4, where mineral super was applied alone, by 10 per cent.

On plot 11, with muriate of potash, it increased the yield over plot 5, where the muriate of potash was applied alone, by 1 per cent

Mineral Super.

Applied on plot 4 alone, it yielded 23 per cent. more than the average of the unmanured plots.

On plot 7, with nitrate of soda, it increased the yield over No. 2, where nitrate of soda was applied alone, by 18 per cent

On plot 8, with sulphate of ammonia, it increased the yield over No. 3, where sulphate of ammonia was applied alone, by 20 per cent.

On plot 9, with muriate of potash, it increased the yield over No. 5, where muriate of potash was applied alone, by 10 per cent.

On plot 13, with nitrate of soda and muriate of potash, it increased the yield over No. 10, where these materials were applied without the phosphate, by 21 per cent.

Comparing plots 16 and 2, 2 cwt. of mineral super in No. 16, added to the 56 lb of nitrate of soda of No. 2, increased the yield by 24 per cent.; while 2 cwt. on No. 17 gave 7 per cent. less than 1½ cwt on No. 4. It is quite evident that the natural fertility of Nos. 17 and 18 was below that of the rest of the plots.

Muriate of Potash.

Applied alone on plot 5 it increased the yield over the average of the unmanured plots by 12 per cent.

On plot 9 it decreased by 1 per cent. the yield of No. 4, where mineral super was applied alone.

On plot 10 it gave the same yield with nitrate of soda that nitrate of soda gave on No. 2, where applied alone.

On plot 11 it gave the same yield with sulphate of ammonia that this material gave on No. 3, where applied alone.

On plot 13, where added to the application of No. 7—nitrate of soda and mineral super—it increased the yield by but 3 per cent.

Summarising and averaging those results of the trial which are comparable, we find that:—

½ cwt. *Nitrate of Soda* applied under four conditions gave an average increased yield of 4.5 per cent.

½ cwt. *Sulphate of Ammonia* applied under three conditions gave an average increased yield of 8 per cent.

1½ cwt. *Mineral Super* applied under five conditions gave an average increased yield of 18.4 per cent.

½ cwt. *Muriate of Potash* applied under five conditions gave an average increased yield of 2.8 per cent.

From the above the following conclusions are suggested:—

1. The soil experimented with is mostly in need of phosphoric acid next nitrogen, and least in need of potash.
2. That sulphate of ammonia, pound for pound, is more valuable as a wheat manure than nitrate of soda.
3. That increasing the application of mineral super on fairly rich soil above 1½ cwt. per acre, gives no material increase in the yield.
4. That a small addition of nitrogen to the phosphate may be advantageous.

It is hoped that this experiment may be repeated for several years, when a general summarising may reveal some valuable definite conclusions.

NOXIOUS WEEDS.

EUPHORBIA TERRACINA, LINN.

A small, shrubby, annual plant belonging to the spurge or milkwort family; a native of the Mediterranean regions, and doubtless introduced as a garden plant. This plant has for a number of years been growing practically unchecked along the inner face of the coast sandhills and the adjacent sandy soils midway between Brighton and Glenelg. Considerable areas of land are now covered with it, and it appears to be spreading steadily over the grazing lands adjacent. Ordinary cultivation destroys the plant Like the other members of this family, Euphorbia terracina contains a milky, acrid juice, which exudes freely when the skin is injured. Most of these spurges possess poisonous properties, and the juice is reputed to cause festering sores if it comes in contact with the flesh. No stock appears to touch this plant, and we have never heard of any being injured by it. Most of the land on which it is growing is of very little value, hence no serious attempt has been made to destroy it.

Euphorbia terracina makes usually a small bush 1½ to 2 feet in height; but in moist places, and where it is not overcrowded, it not infrequently reaches a height of 3 feet 6 inches. The leaves on the main stem are from 1½ inches to 2½ inches long by about ⅜ inch wide, and somewhat blunt at the end, while the leaves on the flowering branchlets are short, broad, and usually somewhat heart-shaped. The flowers are quite inconspicuous, being small and greenish yellow in colour. In its early stages the leaves are pale green, and the lower part of the stem shows a crimson pink tinge. As the plant matures the leaves assume a buff or straw colour, and the stems and branches show a marked development of the crimson shade.

For a number of years the Brighton Municipal Corporation has been trying to secure the proclamation of this weed under the name of Euphorbia lathyris, and last year the necesary resolutions were carried by Parliament, and the plant gazetted. I do not know who was responsible for this name being applied to the plant in question, but on looking up the botanical description of E. lathyris I found it described as a perennial, with long smooth leaves 3 inches to 4 inches in length. Specimens of the weed growing at Brighton were then forwarded to Mr. J. H. Maiden, Botanist to the New South Wales Department of Agriculture, who identified it as Euphorbia terracina.

DEPARTMENTAL NOTES AND WORK.

The Conference of Northern Branches of the Agricultural Bureau was held at Gladstone on February 10, and of Murray River Branches on February 24 at Mannum. In neither instance was the attendance of Bureau members satisfactory. At Gladstone, in addition to the members of the local Branch, four Branches were represented by a total of nine members. At Mannum three Branches were represented by six members in all. This very sparse attendance indicates a feeling of indifference on the part of the members of the Bureau, which is greatly to be regretted. Unless these gatherings are better supported by the Branches interested the Department will not be justified in sending officers to attend them. It is hoped that the Strathalbyn Conference, on March 24, and the Bordertown Conference, on April 7, will be better attended.

Mr. W. L. Summers, Inspector of Fertilisers, attended Gladstone Conference on February 10, and spoke on manures for wheat crops. During the month he twice visited Wallaroo for the purpose of obtaining samples of imported fertilisers, as well as those of local make. He has also taken several samples at Port Adelaide, and the results of the analyses of the samples are published in this issue of *The Journal*. As will be seen from the figures given, the fertilisers are, with very few exceptions, above the value guaranteed by the vendors.

The vintage at the Agricultural College was commenced on February 23, and Professor Perkins is superintending operations in connection therewith. Owing to the favourable season the make of wine is expected to be considerably above the average. The Farm Foreman (Mr. F. L. Faulkner), having been appointed to a responsible position under the Western Australian Department of Agriculture, will shortly sever his connection with the College. In Mr. Faulkner's removal the Department loses a very valuable officer.

During February the diploma and sessional examinations in connection with the Agricultural College took place. The examinations were concluded on February 22, and results will be available shortly. On February 26 the Principal attended the Annual Conference of Northern Yorke's Peninsula Branches of the Bureau at Paskeville, and gave an address on fertilisers.

Besides his ordinary routine work, Mr. Quinn has visited orchards at Mount Crawford, Beetaloo Valley, Marion, Gumeracha, Kenton Valley, and Balhannah, giving public instruction and demonstrations in summer pruning and discussing general matters of concern to the fruitgrowers. A lecture was given at Gumeracha on "Training Fruit Trees," before the Branch of the Agricultural Bureau. The Conferences of the Northern Branches of the Agricultural Bureau, held at Gladstone, and of the Murray River Branches, at Mannum, have also been attended by him, and appropriate addresses given at each. The annual examination in fruit culture for the College diploma course was conducted by Mr. Quinn at the Agricultural College at Roseworthy. In connection with the export of apples to Europe he has at the request of several exporters who take final delivery of the fruit at the ship's side acted as judge as to what is fit for export.

During February Inspectors Rowell and Brown certified for export to interstate markets 11,548 cases of fruits, 3,081 packages and crates of vegetables, and 7 parcels of plants. Within the same period 1,800 cases of fruit and 59 parcels of plants were admitted to the State. Of these 67 cases of bananas were destroyed owing to over-ripeness, and 11 parcels of plants were detained or confiscated because the necessary declaration respecting the absence of phylloxera in the gardens from which they originated was not

forthcoming The departmental Inspectors who, by special arrangement, act as umpires between certain packers and buying exporters to Europe, have passed 731 cases of apples as suitable for export during February

The apple shipping season has opened with good prospects, and larger consignments than usual have been dispatched During February 11,593 cases have been forwarded to European and Indian ports Some very fine samples of our orchards' produce have been packed but there is yet much room for improvement in some of the consignments in the direction of grading, packing, and the selection of varieties for these early boats. It is extremely doubtful whether the Stone Pippin and Rome Beauty samples will refrain from shrivelling when gathered at this early stage

COUNCIL OF AGRICULTURE.

The monthly meeting of the Council of Agriculture was held in Adelaide on Tuesday, February 9 all the members but Messrs B Basedow G R Laffer and T Hardy being present

The Secretary read correspondence in reference to alleged injury to butter during transit on the railway from the North Messrs R Caldwell and J W Sandford to whom the matter was referred at previous meeting have reported on the matter the former holding that the correspondence showed the railway authorities to be to blame while the latter expressed the opinion that the damage resulted from the shipping of butter in the ordinary brake van during hot weather and that there was nothing to indicate that the boxes had been roughly handled It was pointed out that the officers of the Railway Department were equally at variance on this point, and members thought they could not under the circumstances express any opinion as to who was to blame It was however, resolved on the motion of Mr Miller that the Council endorse Mr Thomson's suggestion that the railway authorities should impress on their employes the necessity for the exercise of greater care in the handling of dairy produce

Mr Caldwell referred to the departure of Mr Thomson, the Dairy Instructor, and on the motion of Mr Sandford it was unanimously resolved that the members of the Council place on record their high appreciation of the services rendered by Mr Thomson and express regret that the State should lose the services of so valuable an officer

The report of the Agricultural Bureau Committee, recommending the appointment of the following new members of Branches was approved — Mundoora Messrs T Dick and J Stringer Strathalbyn Mr J W C Fischer Gawler River Mr H Dawkins Port Elliot Mr Williamson Swan Reach, Messrs C Stoeckel and B Fischer Carrieton Messrs J Ormiston and J A O'Halloran Stockport Messrs S Nairn H Bald, and C Branson, Minlaton, Messrs B W Newbold and A Evan Utera Plains, Mr J. Abrook Approval was also given to change of name of Holder Branch to Waikerie

Longwood Branch wrote in reference to the fact that the bags of bonedust sold to contain 1 cwt were often several pounds short weight An instance was given where eleven bags averaged 7 lb short of the alleged weight The Branch thought some action should be taken to check the weights of bags of manure In reply to questions the Secretary stated that it was impossible to do this In a hot climate all manures would lose a certain amount of moisture especially if stored for several weeks in an iron store or exposed to the drying wind Bonedust and bone super would suffer in this respect more than other manures and while the manufacturer might put 2 lbs to 3 lbs overweight in the bags it was not improbable that after being in the retailer's store for a few weeks there would be a deficiency in the weight It was decided to inform the Branch that the Council could do nothing in this matter the only course being for the buyer to insist on the manure being weighed on being purchased

Mr Miller referred to the question of bleached wheat millers docked the farmer severely for wheat that was bleached, because they contended that it was injured for milling purposes The farmers, however, held the opinion that more was made of this matter than was warranted, and he moved that the Department should carry out tests to determine to what extent the value of bleached wheat for flour-making purpose has deteriorated, and that for this purpose the small mill purchased by the Government should be fitted up at once. This was carried.

Mr. Krichauff called attention to alleged successes obtained in Italy in the destruction of phylloxera on the roots of vines by the use of electricity.

The monthly meeting of the Council of Agriculture was held on Tuesday, March 1, all the members but Messrs. Basedow and Hardy being present.

Col. Rowell reported on visit by members of the Council to Mr. J. C. Grasby's Glengyle Orchard, for the purpose of inspecting the results of the adoption of the practice of summer pruning apples and pears. While he admitted that great benefit was derived in that the fruit was more uniform in size and quality, and borne close to the main branches, thus considerably reducing the risk of loss from wind, the system would require a good deal more testing before it could be generally recommended. With the varieties naturally dense in foliage he had no doubt that the practice was beneficial, but other varieties, such as the Jonathan, which were sparsely foliaged, did not lend themselves to this treatment. With some of these sorts he considered that they would get better fruit under the old system. He was also convinced that the adoption of the practice of cutting away the laterals during the summer would with many varieties result in the fruit getting sunburnt. Mr. Dawkins suggested that merely breaking the laterals, as recommended by Mr. Quinn, would probably get over this difficulty. Mr. Laffer did not think that sparse foliage was the cause of sunburn; over-cropping caused the branches to bend over, thus exposing the shaded side of the fruit to the sun, and, in his opinion, this was more often the cause of sunburn. With some kinds of apples the treatment advocated by Mr. Grasby would very materially reduce the fruit crop. A hearty vote of thanks was accorded to Mr. Grasby for his courtesy in affording the members an opportunity of inspecting the results of his experiments.

Messrs. Caldwell and Molineux reported on visits to Gladstone and Mannum Conferences, and strongly criticised the members of the surrounding Branches for the lack of support accorded to the Branches arranging the Conferences. Members were of opinion that unless these gatherings were better supported in the future they would not be justified in attending them.

Some discussion ensued on the complaints of farmers that the returns received from the city produce auctioneers did not fairly represent the value of the cream forwarded. Mr. Sandford said often these complaints were based upon a so-called check test. The farmer would send a ten-gallon can of cream to Adelaide, but the next lot he would perhaps churn at home, and if he got more butter from it than from the factory lot he at once jumped to the conclusion that he was being defrauded. The dairyman was apparently not aware, or else overlooked the fact, that the yield would largely depend- (1) upon the thickness of the cream, variations in speed of separation would result in variation in the thickness of the cream; (2) age and degree of ripeness of the cream; (3) condition of the cream when churned; (4) the quantity of milk left in the butter. It was ridiculous to make charges of fraud of this character, as no produce merchant carrying on business on a large scale could possibly manipulate the returns to the detriment of the farmer without a number of his employes knowing, and no man, apart from any question of the morality of the business, would be so foolish as to place himself in the hands of his men in this way.

Resolutions from Wilmington Branch in reference to membership of Branches were considered. It was thought that the adoption of a rule providing for the retirement of one-third of the members of the Branch each year, and the election of their successors by proper ballot, would probably be an improvement on the present practice, and it was pointed out that each Branch has power to adopt such a rule if thought fit. The Council, however, could not agree to forego its right to confirm or reject any nomination, as was suggested by the Wilmington Branch.

The Minister forwarded request from Truro District Council that Echium vulgare should be declared a noxious weed. It was pointed out that this blue-flowered weed was very prevalent about Gladstone, Laura, and surrounding districts, in places in the Barossa district, and about Adelaide On the motion of Mr. Miller it was decided to recommend the Minister to have it placed under the Noxious Weed Act. Col. Rowell, however, considered it waste of time making any such recommendation. Weed after weed had been proclaimed, and although the Government knew that most District Councils ignored the law. they would not take any steps to enforce the Act. Mr. Krichauff was opposed to this general condemnation of a plant as a noxious weed. The Government should adopt the recommendations frequently made by the late Central Bureau by amending the law and obtaining power to declare a plant noxious in the particular districts in which it was a nuisance.

Mr. Krichauff read extracts bearing out statements recently made by Mr. Thomas Hardy that in certain phylloxera infested vineyards in France the pest was combated by liberal applications of mineral fertilisers.

On the motion of Mr. Sandford it was resolved to urge on the Minister the necessity for suitably filling at the earliest opportunity the position of Dairy Instructor, rendered vacant by Mr. Thomson's resignation.

Mr. Laffer referred to the fact that some of the apple trees at Mylor Typical Orchard were now bearing fruit, and he thought they should endeavour to get the Director to consider with them the best means of making the orchard of real value to the industry. He thought the fruits of the new varieties should be examined by men competent to judge whether they were superior to those in use at present, as if they only got one variety ripening earlier than the Jonathan apple and fit for export to Europe it would be of great value to the State. It was resolved that Mr. Holtze be asked to confer with the members of the Viticultural and Horticultural Committee on the subject.

DATES OF MEETINGS OF BRANCHES OF THE AGRICULTURAL BUREAU.

With a view of publishing in the "Journal" the dates of meetings of the branches of the Agricultural Bureau, Hon. Secretaries are requested to forward dates of their next meetings in time for publication

BRANCH	Date of Meeting		BRANCH	Date of Meeting.	
Balaklava .	Mar. 12	April 9	Minlaton .	Mar. 19	April 23
Booleroo Centre ..	1 & 29	26	Morgan .	26	—
Bowhill ..	5	2	Mount Remarkable	31	28
Brinkworth ..	4	1	Nantawarra .	2 & 30	27
Burra ..	11	8	Naracoorte ..	12	9
Carrieton ..	—	26	Narridy ..	5	—
Cherry Gardens ..	8	12	Norton's Summit ..	25	29
Clare .	25	29	Onetree Hill .	31	28
Colton ..	5	2	Penola .	12	9
Elbow Hill .	1 & 29	26	Pine Forest	1 & 29	26
Finniss .	7	4	Port Broughton .	31	28
Forest Range ..	31	28	Port Elliot .	19	16
Forster .	26	—	Port Lincoln ..	18	15
Gawler River .	25	29	Pyap	2	6
Gladstone .	5	2	Reeves Plains .	11	4
Golden Grove .	3 & 31	28	Richman's Creek ..	28	—
Inkerman .	1	—	Riverton ..	26	30
Johnsburg .	26	—	Saddleworth .	18	15
Kanmantoo	25	29	Stansbury ..	5	2
Kapunda ..	5	2	Strathalbyn ..	15	19
Kingscote ..	14	11	Utera Plains ..	26	30
Kingston ..	5	2	Virginia .	28	25
Koolunga ..	31	28	Wandearah .	28	25
Longwood	26	—	Whyte-Yarcowie .	19	16
Maitland .	5	2	Willunga ...	5	2
Mallala ..	7	4	Wilmington	2 & 30	27
Mannum .	19	16			

MONTHLY RAINFALL.

The following table shows the rainfall for the month of February, 1904:—

Adelaide	0·27	Manoora	—	Echunga	1·77
Hawker	1·45	Hoyleton	0·46	Macclesfield	1·66
Cradock	3·47	Balaklava	0·34	Meadows	2·40
Wilson	3·32	Port Wakefield	0·77	Strathalbyn	0·95
Gordon	2·33	Saddleworth	0·88	Callington	0·66
Quorn	2·53	Marrabel	0·91	Langhorne's Bridge	0·38
Port Augusta	1·46	Riverton	0·90	Milang	0·40
Port Germein	0·78	Tarlee	0·86	Wallaroo	0·24
Port Pirie	0·93	Stockport	0·53	Kadina	0·22
Crystal Brook	0·94	Hamley Bridge	0·70	Moonta	0·50
Port Broughton	0·36	Kapunda	0·91	Green's Plains	0·29
Bute	0·76	Freeling	0·49	Maitland	1·01
Hammond	1·93	Stockwell	0·84	Ardrossan	0·62
Bruce	1·80	Nuriootpa	0·98	Port Victoria	0·81
Wilmington	1·90	Angaston	0·95	Curramulka	0·81
Melrose	1·57	Tanunda	0·90	Minlaton	0·86
Booleroo Centre	2·06	Lyndoch	0·71	Stansbury	0·73
Wirrabara	1·83	Mallala	0·27	Warooka	0·69
Appila	1·46	Roseworthy	0·88	Yorketown	0·51
Laura	1·30	Gawler	1·68	Edithburg	0·54
Caltowie	2·18	Smithfield	0·47	Fowler's Bay	1·11
Jamestown	1·35	Two Wells	0·24	Streaky Bay	0·78
Gladstone	1·16	Virginia	0·25	Port Elliston	0·67
Georgetown	1·26	Salisbury	0·62	Port Lincoln	1·00
Narridy	1·25	Tea Tree Gully	0·65	Cowell	0·60
Redhill	0·88	Magill	0·93	Queenscliffe	0·71
Koolunga	1·24	Mitcham	0·49	Port Elliot	0·52
Carrieton	3·17	Crafers	2·45	Goolwa	0·50
Eurelia	2·52	Clarendon	1·68	Meningie	0·58
Johnsburg	3·38	Morphett Vale	0·93	Kingston	0·95
Orroroo	1·72	Noarlunga	1·04	Robe	0·73
Black Rock	1·69	Willunga	1·44	Beachport	0·76
Petersburg	2·76	Aldinga	0·94	Coonalpyn	0·41
Yongala	1·71	Normanville	0·52	Bordertown	0·90
Terowie	2·04	Yankalilla	0·52	Frances	1·02
Yarcowie	1·58	Eudunda	1·25	Naracoorte	0·82
Hallett	1·16	Truro	1·08	Lucindale	0·63
Mt. Bryan	1·52	Palmer	0·30	Penola	1·25
Burra	1·22	Mount Pleasant	0·94	Millicent	1·09
Snowtown	0·57	Blumberg	0·93	Mount Gambier	1·43
Brinkworth	0·75	Gumeracha	0·93	Wellington	0·32
Blyth	0·59	Lobethal	1·68	Murray Bridge	0·39
Clare	1·11	Woodside	1·10	Mannum	0·15
Mintaro Central	—	Hahndorf	1·17	Morgan	1·69
Watervale	0·98	Nairne	1·06	Overland Corner	1·08
Auburn	1·08	Mount Barker	1·70	Renmark	0·94

FARM AND DAIRY PRODUCE MARKETS REVIEW.

Messrs A W Sandford & Co report on March 1, 1904 —

Sultry weather conditions prevailed during the greater part of February until the highest reading of the thermometer for the summer was touched, namely 108 deg in the shade, when a monsoonal depression set in, culminating in exceptionally heavy rains, especially in the far north and eastern country some parts being flooded However, taking all round, it is stated to be by far the best downpour that has fallen for many years, and squatters are well pleased with the very assuring prospects Farmers in the northern areas are also already looking forward to favourable ploughing and seeding conditions

In commercial circles the volume of business put through has been anything but extensive, so that only a quiet month's trade is recorded, although it was quite expected that the moneys received for the harvest would be well in circulation by this time but, fortunately, most farmers wisely held on to their Wheat owing to the low prices then offering, and as a substantial advance has since taken place, all who refused to sell have been well rewarded There has been scarcely any fluctuation in Copper and Lead, so that quotations are unaltered but Silver has hardened no doubt owing to the Eastern troubles

BREADSTUFFS When we last wrote the European markets were dull, with U K cargoes valued at 28s 9d and this state remained for some eight or ten days when the outbreak of the war between Japan and Russia immediately strengthened the demand and prices advanced to 32s 9d per quarter of 480 lbs U K or Continent It now appears that the war was not the only factor in this advance, for values have again fallen and 32s , with a dull market is reported there are also plenty of resellers The cause of the fall is attributed to lower prices in America The advance in Europe immediately affected the Australian markets and 3s 4d to 3s 5d was obtainable for shipping parcels f o b Now however there is little disposition to buy so that values have eased throughout the Commonwealth No large sales of Flour have been reported during the month as buyers refused to give the advance asked by the millers In Offal there has been a decided firmness and contracts for Bran have been made for delivery during the year at 8d per bushel Millers, as previously reported are not anxious to sell for spread delivery as there is little chance of the mills working full time for any extended period Forage traders have had a dragging month's business the plentiful supply of feed causing little or no demand locally and as the same conditions prevailed throughout the Commonwealth there has been scarcely any Chaff exported excepting a few parcels of extra prime Feeding Grains It was generally recognised that bedrock quotations were touched a month ago which induced heavy buying orders to come along so that a decided improvement in Oats set in although there is plenty of room yet for further advance However the market in this line is decidedly healthier Cape Barley also participated in the firming but this mostly owing to maltsters buying freely

POTATOES It was hoped that as Western Australia had started operating here the downward trend in values would cease but the drooping continued partly owing to those raised locally coming very freely on the market coupled with the fact that the early Gambier crop is now a strong competitor for the country and Western Australian trade so that growers were forced to accept abnormally low prices for the time of year ONIONS — Planters in this line have also experienced an unsatisfactory month's sales, the yield being heavy and as the plains grown are not of a keeping quality owners were compelled to quit at almost any figure but as these are now finished a better tone has already set in

February is one of the worst months of the year for the marketing in good order of Dairy Produce the tropical weather experienced at times preventing a number from forwarding their butters and as the summer rains had brought up a quantity of rank growth the quality from many of the districts was seriously affected However towards the end of the month, cooler conditions prevailed when a much stronger demand set in, and a decided advance in price was established for top qualities of well-conditioned lots but values show no improvement for any weedy-flavoured or pastry sorts Eggs have had good sale, heavy buying orders mostly from Western Australia, preventing any accumulations and firmed about a penny per dozen Cheese has had to suffer a further easing in values, owing to shipments being landed from the eastern States, where almost record rates are quoted. Bacon.—Although the sales locally and for export have been active, curers reduced their buying price for the live animal, having in view the cheapness of grain and the knowledge that the stubble pigs have yet to come in. Therefore, in sympathy, values in bacon had to give way. Hams.—As the market keeps oversupplied, sales continue to drag. Almonds.—The new season's crop is now coming forward and meeting with very fair sale, but quotations are unaltered. Honey.—It was expected that a firmer market would rule owing to the extremely light yield, but any advance is precluded on account of low values in the neighbouring States.

In Live Poultry buyers are complaining of the quality of most of the birds now being marketed, therefore farmers would do well to see that the poultry is fattened before forwarding.

Market Quotations of the Day.

Wheat.—At Port Adelaide, shipping parcels, new, 3/2 to 3/3 per bushel 60 lb.

Flour.—City brands, £8 10/-, country, £7 10/-.

Bran.—7½d., Pollard, 8½d. per bushel of 20 lb.

Oats.—Local Algerian and Dun, 1/5½ to 1/6½, White Champions, 1/8 to 1/10 per bushel 40 lb.

Barley.—Malting, 3/- to 3/6, Cape, 1/10 up to 2/6 for prime, per bushel 50 lb.

Chaff.—Nominal, £2 7/6 to £2 10/- for prime, per ton of 2,240 lb., bags in, f.o.b. Port Adelaide.

Potatoes.—New locals, £2 to £2 5/-. Gambiers, £2 10/- to £2 12/6 per 2,240 lb. f.o.b. Port Adelaide.

Onions.—New locals, £2 15/- to £3 5/- per 2,240 lb.

Butter.—Creamery and factory prints, 9d. to 11d., choice separator and best dairy, 8½d. to 10d., fair dairy and medium separator, 6d. to 7d., ordinary store lines, 5½d. to 6½d.; pastry and heated lots 4d. to 4½d.

Cheese.—Factory make, 4¾d. to 5½d.

Bacon.—Factory-cured sides, 7d. to 7½d., farm flitches, 5½d. to 6¼d.

Hams.—S.A. factory, 8½d. to 9½d. per lb.

Eggs.—Loose, 11d., in casks, f.o.b. 1/½.

Lard.—In bladders, 6d., tins, 5d. to 5½d. per lb.

Honey.—2½d. to 2¾d. for dark to prime clear extracted, in 60-lb. tins, Beeswax, 1/2.

Almonds.—Softshells, 4d to 4½d.; Kernels, 9d.

Live Poultry.—Heavy-weight table roosters sold at 1/10 to 2/4 each, good hens and fair-conditioned cockerels, 1/2 to 1/8; poor and light birds, 10d. to 1/-; ducks, 1/3 to 2/3 for medium to good; geese, from 2/6 to 3/-, pigeons, 7d.; turkeys, 4½d. to 9d. per lb. live weight for fattening sorts to prime table birds.

Above quotations, unless when otherwise specified, are duty paid values on imported lines. Grain, Flour, and Forage for export are f.o.b. prices at Port Adelaide. Dairy products are City Auction Mart rates. In Grain, Chaff, and Potatoes sacks are included, but weighed as produce. Packages free with bulk Butter and Cheese.

AGRICULTURAL BUREAU REPORTS.

Carrieton, January 28.

Present—Messrs. Gleeson (chair), Steinke, Kaerger, Davies, Cogan, and Bock (Hon. Sec.), and Mr. Hombsch, of Johnsburg Branch.

Harvest Returns.—Members reported on the returns from their crops. Owing to lack of moisture in the winter and storms and heavy rains during spring returns were very unsatisfactory. The Chairman reported on results of experiments with manures supplied by the Department. Owing to the unfavourable season results could not be taken as a fair indication of the effect of manures, though in every instance he got better returns from the manured land. On the black land the manure appeared to do very little good, but on poor red land its effect was marked. Members thought that probably a light dressing of manure would pay.

Buying Wheat.—Mr. Gleeson read a paper on standard sample, grading, and weighing wheat. The present season's dearly-bought experience should have taught the farmers a lesson and made them determined to have some alteration in the present unsatisfactory system of fixing the standard sample of wheat. Farmers in the North were delivering wheat to the merchant for five weeks prior to the fixing of the standard sample, and any that did not reach 63 lb. per bushel was docked 1d. per bushel for each pound under weight. If the standard had been fixed reasonably early in the season the farmers' losses would have been very small, as most of the wheat weighed 61¼ lb. per bushel. It was time the various Branches of the Agricultural Bureau united to make a special effort to secure the adoption of a system that would not inflict so much injustice on the farmer. He thought the only fair way was to have two grades of wheat No. 1, 65 lb. per bushel, and No. 2, 62 lb. per bushel. All wheat going over 62 lb. should be paid ¼d. per lb. per bushel more than market rates, as an inducement to farmers to clean their wheat better. Any wheat failing to reach 62 lb. per bushel would be subject to reduction in price Then the farmers should find out definitely by practical test whether bleached wheat was so much inferior for flour-making purposes as the buyers make out. The system of weighing the wheat sample was also far from satisfactory, as it was practically impossible to twice fill the small measure used by the buyer and get exactly the same result each time. They should insist on the use of a measure holding at least two pounds. He thought steps should also be taken to stop wheat above and below the standard being mixed, as was the case now, by buyers.

Mount Remarkable, January 28.

Present—Messrs. Challenger (chair), Jorgensen, Morrell, Foot, T. P. and G. P. Yates, McIntosh, Casley, Giles, and O'Connell (Hon. Sec.).

Cattle Complaint.—Mr. Casley reported death of young, pure-bred, Jersey bull. The animal was ill for about a month, the nose and skin being dry, stomach swollen, excreta hard and dry. The animal rapidly fell off in condition, and, though treated with Epsom salts and linseed oil, it had no effect. Members thought the animal died from sand.

Noxious Weeds. A short discussion on this subject took place. Weeds are very plentiful and troublesome in this district, and members consider active measures should be taken to destroy them.

Poultry on the Farm.—The Hon. Secretary read a paper on this subject:—The keeping of poultry had been threshed out often of late, yet he thought most of the ideas had been altogether too elaborate to be carried out on an ordinary farm. The much-despised hen is at once the most profitable and most neglected of all domestic animals, and whilst the farmer is most careful in his breeding and selection of his horses, cattle, sheep, etc., he does not trouble his head in the least about those of his poultry. Apparently the farmer considers that anything beyond the old barndoor mongrel will not pay on a *farm*; well-bred fowls are only fit for town folk. Now, if these well-bred fowls pay the townsman, who has to buy everything and has often no run, just a little, cramped-up yard, why, in the name of commonsense, would not they pay on a *farm*, where there are cheap food and plenty of run for them? He maintained that a farm was the best possible place wherein to breed and rear a good strain of laying hens, but it takes some time and trouble. He never knew of a farmer who kept good fowls but made a lot of money out of them. The idea that a pure-bred fowl is not as healthy and hardy as the barndoor is absurd. Purebred fowls, so long as they are not too much inbred, are just as hardy as any other. Of course some breeds are hardier than others, and the same applies to many of our domestic animals. Shelter was the first thing necessary, and there are two kinds, natural and artificial. The first is the better if it can be got, and consists of bushes, hedges, and low, shrubby trees to roost in. Gum trees are by far the best, as they do not harbour tick. [?—Ed.] Here is where the farmer has the great advantage of the town fancier, as the latter is compelled to provide artificial shelter. In Australia fowlhouses are not at all necessary in wooded districts, but it must be at once recognised that fowls must have either the one or the other. When artificial shelter has to be provided galvanized iron should be mainly used, and the less wood the better, as it harbours tick. Fowls should not be crowded or cramped; if they are, disease will very soon set in. The houses should be kept very clean, and sprinkled daily with lime and ashes to keep down bad smells Few animals are so prone to disease as fowls, and no wonder, when they are kept week after week in a low, badly-ventilated, filthy and foul-smelling shanty. On a farm the feed should consist mostly of wheat, and it cannot be beaten very much, so long as it is cheap. It would pay to get a few bags crushed when getting his horsefeed done, as a hot breakfast is very beneficial in winter time. A pound of copra to, say, 3 lb. or 4 lb. of crushed stuff, given hot in the morning, will very materially increase the supply of eggs during the winter months, when they are from 1s. to 2s. a dozen, and often more. It pays. Where there is a good run they want a feed of wheat at night time, and very little else. They pick up a lot of other stuff, grit, bone, grubs, etc., during the day. In the North they mostly breed for egg production, being too far removed from market to go in for table birds. They should, therefore, go in for fowls that lay most at the time when they are dear. Leghorns, Andalusians, Minorcas, Spanish, and Hamburgs may lay most eggs in a year, but they are not very good winter layers All those, except the Minorca, are useless as table birds. The Minorca was, to his idea, the best farm fowls. They are strong, hardy, and great foragers. They are like Ayrshire cattle, if they cannot get food at home they will search their neighbours' places for it. They will not go hungry if they can help it. Among winter layers they had the Wyandotte, Orpington, Langshan, Dorking, and Plymouth Rock, but many of these are not suited to the North, as they do not do well in summer. They carry too many feathers and cannot stand the heat, but they are all the best of sitters and mothers It would pay the farmer to get a few yards of 6-ft. wire-netting and make a breeding pen, where he could shut up, say, six or eight hens and a rooster in the breeding season. He would want no rooster at all among his laying hens. They lay better without him, and the farmer would not be bringing chickens to the store when he keeps his eggs longer than he ought to. When the breeding season was over, turn out the hens, and keep the rooster shut up all the time. In this way, by breeding from the best hens only, they could work up a grand breed of laying hens, with little or no expense. Where possible fowls should not be kept in flocks of over fifty. If they could be spread over the farm in several colonies, so much the better. They take less feed, lay better, and keep much more healthy. Some farmers adopt a wise plan. They have portable houses, and, when done harvesting, they shift these out in the various stubble paddocks and keep them there for three months. During that time the fowls get no feed but what they can gather, but water troughs are filled twice a day. I may here state that fowls should at all times have a full supply of cool, clear water, well protected from the rays of the sun. Bad water causes plenty of disease in poultry.

Tatiara, January 30.

Present—Messrs. Fisher (chair), Sexton, Reschke, Penny, Moten, Rankine, Makin, Prescott, Rankine, and Bond (Hon. Sec.)

Bags as Wheat.—The Chairman initiated a discussion on this subject, the present practice not being favoured by members. It was decided that the matter be brought forward at Conference in April.

South-Eastern Conference.—It was decided that the Annual Conference of South-Eastern Branches be held on Thursday, April 7. [Owing to a mistake, the date of this Conference was given in the February issue of *The Journal* as April 6.—Ed.]

Quorn, January 30.

PRESENT—Messrs. Thompson (chair), McColl, Venning, Herde, Finlay, Cook, Patten, Toll, Walker, and Noll (Hon. Sec.).

HON. SECRETARY.—Mr. Noll tendered his resignation as Hon. Secretary, owing to pressure of private business. Great regret was expressed at Mr. Noll's resignation, and a hearty vote of thanks was accorded him for his services over so long a period. Mr. G. Walker was appointed Hon. Secretary.

RUST-RESISTING WHEATS.—Some discussion on this subject took place. Members stated that owing to the dryness of the district they had but little experience of rust.

BLEACHED WHEAT.—It was resolved that the Department of Agriculture be asked, in the interests of producers, to test the flour-making qualities of wheat, especially bleached wheat.

Mundoora, January 29.

PRESENT—Messrs Harris (chair), Blake, Dick, Aitchison, Loveridge, Shearer, Owens, Mildren, and Gardiner (Hon. Sec.).

NATIVE GRASSES —Mr Blake tabled splendid growth of grass, which is now very plentiful in this district. Stock were very fond of it, and did well on it. It was decided to forward the grass to the Department of Agriculture for identification. [This is one of our valuable Panic grasses. It is highly esteemed for fodder, and should be well worth cultivation, as with a little moisture in the warm weather it makes good feed.—ED.]

PLOUGHS.—Discussion took place on the best ploughs to use in this district. Lightness of draught was considered essential, hence the necessity for using steel wherever possible The ploughs should be made to cut all the ground, leaving none to be broken by the pressure. The various makers' ploughs were discussed in detail.

Koolunga, January 28.

PRESENT —Messrs. Butcher (chair), Palmer, Shipway, Jose, Atkinson, Lawry, Burgess, Butterfield, and Noack (Hon. Sec.).

SELECTION AND TREATMENT OF SEED WHEAT.—At previous meeting Mr. W. T. Cooper read a paper on this subject. He advised farmers to grow more largely of the rust-resisting wheats, many of which were early and held the grain better against storms than did the softer varieties. He also thought it would pay to get a change of seed often, instead of growing the same kind year after year on the same land. He would not altogether discard the old favourites, such as Red Straw, Purple Straw, Ward's Prolific, etc., as they were good yielders, and suitable to the district. The soft wheats should not comprise more than one-third of the area under crop, and should be sown on rising land. Wheat for seed should be put through the winnower twice, to remove all small grain, foreign seeds, etc. He strongly advocated sowing only large, plump seed He would always pickle the seed before sowing, using 2 tb. of bluestone dissolved in four gallons of water, to pickle three bags of wheat. He puts the wheat on a cement floor, sprinkles it with the pickle, and turns it well twice with a shovel. He believed it was in every farmer's power to have crops free from smut. Members were of opinion that some of the old wheats were still too good to be discarded in favour of the newer varieties, and also that the time was at hand when farmers would see the necessity for grading their wheat more carefully.

NOXIOUS WEEDS. Mr. G. Jose read a paper on this subject. One of the worst weeds on the flats in this district was the star thistle (?). In some paddocks it was allowed to seed unchecked year after year, and had spread to an alarming extent. Where land is rented yearly it is out of the question to expect the tenant to destroy the weeds unless he is either paid to do so or compelled to do so. Where there are only a few plants they should be chopped up and burnt. Larger areas should be mown and the plants gathered and burnt. It is a good plan to cultivate the land as much as possible to start the seed, and then destroy the young plants with the implements. Some of the wheat this year is practically unsaleable owing to the seeds of the thistles being so numerous in the sample. Some people say stock will live on the thistles, but he hoped he would never see his stock reduced to such feed. Another bad weed was that known as the potato plant. So far as he knew it was not touched by stock. It quickly runs to seed in warm weather, and if cut up it will grow again after a good rain. This year it certainly has been of some use, as it has lessened the danger of fire in the grass paddocks, as owing to there being so much green stuff amongst the dry grass a fire would not spread rapidly. Around Gladstone and Georgetown he noticed a large, blue-flowered weed (Echium vulgare), which had taken complete possession of large areas of land. The wild turnip was also very plentiful in some paddocks, and three or four months ago could be seen standing fully twice as high as the wheat. Farmers should destroy this weed as soon as it is seen. The weed known as "Nancy" is also very troublesome in some parts, but fortunately they were free from it in this district There was, however, risk of introducing it with seed wheat, as many other weeds had been introduced, and farmers would do well to exercise great care in cleaning their seed wheat, especially if obtained from another district. The Bathurst burr was very flourishing this year, and they would soon have to cut it up. He thought members of the various Branches should consider it their duty to report to their fellow-members when any new plants appear that they think may be injurious, as if they are allowed to spread before their objectionable characters are recognised they are likely to be very troublesome. Other members agreed with Mr Jose. Some members found it very difficult to destroy the saffron or Barnaby thistle. The Chairman thought all landowners should be compelled to effectively destroy all noxious weeds, as although in some instances it might inflict some hardship, it would ultimately be to their own benefit. Mr. Shipway thought all watercourses for a chain above highwater mark and all roads should be kept quite free from weeds.

Lucindale, January 30.

Present—Messrs. Feuerheerdt (chair), Tavender Carmichael, Langberg, McInnes, Williams, Dow, Matheson, and Beatton (Hon Sec.), and one visitor.

Oidium.—This disease was very prevalent this year Last year Mr Tavender dressed his vines with sulphuric acid and sulphate of iron, and they were quite free from disease. This year the same treatment had no effect. A sample of apples badly diseased was tabled [Sulphuric acid and sulphate of iron applied to the vines in winter is not a preventive of oidium Freedom from this disease was probably due last year to climatic conditions not being favourable to its development. This year the reverse has been the case. The November, 1903, issue of *The Journal of Agriculture* outlines the treatment for oidium. The apples shown were very badly affected by fusicladium, or scab.—Ed.]

Dairying. The Chairman and Mr. Langberg were appointed to select a good dairy bull for the Branch.

Cradock, January 30.

Present—Messrs. Ruddock (chair), Turner, Gillick, Symons, Garnet, Marsh, Graham, Haggarty, Paterson, Clarke, Fitzgerald, and Lindo (Hon Sec.), and six visitors.

Grading and Sampling Wheat.—A long and interesting discussion on this subject took place. Mr. Gillick strongly advocated the grading of wheat to first, second, and third class. If this were done, there would be no need for the annual difficulty over the fixing of the standard, as each class would fetch its true value, especially if sold by auction, as was done with wool. He thought the adoption of the system of grading and selling parcels of several thousands of bags at public auction would result in the home buyers sending out experienced men to purchase for them. Open competition meant full market value. Mr. Paterson supported, and considered this would lessen the many profits between the grower and home buyer. Messrs. Symons, Fitzgerald, and Clarke considered grading not practicable in South Australia, as wheat of same size and weight was not always of the same value. They considered it better to have a fixed standard of, say, 62 lb. per bushel with a proportionate increase in the price of all wheat over 62 lb. per bushel. On being put to the vote two-thirds of the members favoured Mr. Gillick's suggestion. Members strongly protested against the delay on the part of the Chamber of Commerce in fixing the standard this season, which resulted in severe losses to many farmers, who were compelled to sell wheat under the high standard of the previous season. The Hon. Secretary would like to know how the Chamber of Commerce could arrive at a 61½ lb. standard, as, according to its own printed statements no wheat under last year's standard of 63 lb. could be accepted in averaging the samples on which the standard was fixed.

Davenport, January 28.

Present Messrs. Trembath (chair), Lecky, Hewitson, Hodgson, McDowell, Tickle, Holdsworth, and Pybus (Hon. Sec.).

Hon. Secretary.—Mr. Pybus tendered his resignation as Hon. Secretary, which was accepted with regret, and a hearty vote of thanks accorded him for his services in the past. The Chairman also tendered his resignation, as he had held office for several years, and considered it to the best interests of the Branch that a new Chairman should be elected.

Duck-rearing.—Mr. Tickle read a paper on this subject He had been keeping fowls and ducks for some time with profitable results, but was disposed to give his whole attention to ducks, as they are less trouble and return a greater profit than fowls. The Pekin, Rouen, and Aylesbury are considered the best breeds, and they will do well in the hottest districts. The Rouen was, in his opinion, inferior to the other two, as, although larger, it did not mature so quickly. The Muscovy duck was the largest of all, but was not suitable for table purposes. Of the pure breeds he thought the Pekin the best, but a cross between the Pekin-Aylesbury was considered an improvement. Ducklings were hardier and much easier raised than chickens. They did not suffer from the attacks of tick; a very important point in this locality. They were ready for market at eight weeks to ten weeks old. Plenty of shelter was necessary, as the young ducks suffer severely from the sun's rays if exposed. He fed his ducklings on bran and pollard, with green feed every day, and cooked meat once a week. Last year his ducks cost him 10d. each for food, and realised 6s. per pair This left a very good profit, although foodstuffs were so dear. A lengthy discussion on the relative merits of fowls and ducks for profit ensued.

Kanmantoo, January 29.

Present Messrs Mills (chair), O'Neill, Hawthorne, Lehmann, E. and J. Downing (Hon. Sec)

Wheats A long discussion on wheats suitable to this district took place. The Chairman spoke very highly of Gamma wheat, raised by Mr. W. H. Hawke, of Arthurton. He reaped 25 bushels per acre this year from Gamma, which was quite free from rust, while Scotch Wonder and Purple Straw alongside were very inferior and unsaleable. He noticed that the grain of Gamma did not bleach under the influence of wet weather, as did the other kinds. Mr. Lehmann reported favourably of Silver King. It was a good yielder and rust-resisting. Members consider this variety very suitable for this district.

Minlaton, January 23.

Present—Messrs. Correll (chair), Newbold, Anderson, Martin, Mayer, A. and J. McKenzie (Hon. Sec.).

Rust-resistant Wheats.—Members reported that Dart's Imperial, Purple Straw, and similar wheats were slightly affected by rust in the past season, but the rust-resisting wheats were free from disease. Marshall's No. 3 is a general favourite, nearly every farmer growing some of it, but its resistance to rust has not been severely tested here yet.

Gawler River, January 29.

Present—Messrs Parker (chair), Hillier, King, Barrett, A. M. and H. Dawkins, and Roediger, and two visitors

Grading Wheat—Mr Parker initiated a discussion on this subject, reading extracts from Dr Cobb's bulletin on the subject Members agreed generally with the conclusions arrived at and it was arranged to make enquiries as to the possibility of obtaining a grading machine by combining amongst themselves

Reeves Plains, January 29.

Present Messrs Folland (chair), Arnold Cordon, Oliver, Winton Day and McCord (Hon Sec)

Rust-resisting Wheats A lengthy discussion on this subject took place Marshall's No 3 is mostly in favour Majestic is considered a good hay wheat but the grain is rather small One member favoured growing the heavy-yielding soft wheats like Purple Straw and Dart's Imperial as the losses from rust were not usually severe in this district King's Early met with favour on account of its yielding qualities and the Chairman mentioned a wheat from Victoria known as Early Pavilion Although not rust resistant it had yielded 30 bushels per acre this year

Clare, January 29.

Present Messrs Birks (chair) Kelly Christison Bray Knappstein, Martin Dall Main and Greenway (Hon Sec)

Dust Sprays for Fruit Trees—Mr Kelly read extract dealing with the application of Bordeaux mixture and various insecticides in the form of dust sprays " This was stated to be more effective under certain conditions and also cheaper than the liquid sprays

Summer Crops—Mr Main initiated a discussion on this subject He was pleased to note that the growing of summer fodder seemed to be coming more into favour especially in this district where there was a sufficient rainfall to enable such crops to be profitably grown The utility of such crops as rape maize sorghum and lucerne for stock of all descriptions was undoubted Unquestionably the best of all was lucerne which once established will last under proper treatment for many years and yield heavy crops He thought sorghum better for cows than maize since it results in the production of harder and better flavoured butter than maize Early Orange Amber Cane was the best variety of sorghum to grow Maize was best chaffed and fed with chaffed hay to cows Johnson grass was a good fodder to sow on the stubbles True it was difficult to eradicate but as it was essentially a summer grower it would not interfere with the succeeding cereal crop Mr Birks found that sheep did not take very readily to sorghum at first, but they do well on it when used to it As to sowing sorghum on the fallow he found it difficult, owing to this being a late district to get the sorghum off in time to prepare the land properly for wheat The result was that he had got a bag less per acre where sorghum was grown on the fallow He thought the better practice would be to put the sorghum on the stubble land Mr Main stated that in some parts of New South Wales the lucerne fields were broken up occasionally and sown to wheat Usually a good crop was obtained, after which the lucerne would grow well again without any further seeding

Rhine Villa, February 5.

Present—Messrs G A Payne (chair), H W Payne, Mickan, Hecker, Pannach, W T and J W Vigar (Hon Sec)

Rust-resisting Wheats—Some discussion on this subject took place, but members state that they have very little experience with rust, as with the exception of small patches of crop in the moister land, the wheat usually ripens too early for rust to do much harm.

Denial Bay, January 31.

PRESENT—Messrs. Smith (chair), Lowe, Dunnet, McKenzie, Starling, Crocker, Meier, Wisselmann, G. J. Gale, and W. O. Gale (Hon. Sec.).

HARVEST AND RED RUST.—Samples of rust-resisting wheats were tabled by Mr. Wisselmann and the Hon Secretary It was estimated that last season 21,000 acres were under crop in this district, the yield averaging about 4 bushels. Members considered that frost and rust had reduced the yield fully 6 bushels per acre.

STANDARD SAMPLE OF WHEAT. -Considerable discussion on this subject took place, all the members being of opinion that the present practice of changing the sample every season and so late in the season was very unsatisfactory. The system of docking for wheat under the sample was also unfair. Mr. Lowe thought the farmers were entitled to some say on this question, though it appeared that the Chamber of Commerce merely studied the interests of the wheat merchants and foreign buyers. It was unanimously resolved that all Branches of the Bureau be asked to combine to try to get a fixed standard, and that all wheat from 60 lb to 63 lb. per bushel be classed as "f.a.q."; wheat under to be docked, and wheat over these weights to be paid extra *pro rata* per bushel. Strong feelings of dissatisfaction were expressed at the way in which the farmers had been treated by the buyers this season, and the hope expressed that it would not be long before the middleman in the wheat trade could be dispensed with.

BAGS AS WHEAT This question was also discussed at length. Members generally thought that it would give greater satisfaction if merchants would revert to the former practice of buying wheat at net weight, and giving the farmer the option of buying or borrowing the bags.

Port Pirie, January 30.

PRESENT -Messrs Wright (chair), Humphris, Jose, Teague, Johns, Hector, Lawrie, Morrish, Crispin, and Wilson (Hon Sec)

RUST-RESISTING WHEATS - Discussion on this subject took place, the following wheats being recommended for this district —Gluyas, Carmichael's Eclipse, Budd's Rust-resistant Phillis Marvel, and Marshall's No. 3 Mr. Jose tabled sample of Californian wheat grown from seed obtained from a shipment of wheat imported last year It was a very poor sample, pinched, and badly affected by rust

Crystal Brook, February 6.

PRESENT Messrs Pavy (chair), G and G M Davidson, W. and A. Hamlyn, Hutchison, Townsend, and Symons (Hon. Sec.)

RUST-RESISTING WHEATS.—Mr W. Hamlyn read a paper on this subject Some of the earlier rust-resisting wheats grown in this neighbourhood produced dark, flinty grains, which millers in a good season would not pay full price for. Of late years, however, they had received a number of such wheats, which fetched full prices He had grown Carmichael's Eclipse wheat for five years, and had seen no sign of rust, even on the flag It stands up well, ripens early, is a good yielder, but not suitable for hay, the straw being hard. He had grown Phillis Marvel for the first time this season, and was very favourably impressed by it. It yielded 19 bushels per acre, and was quite free from rust, but for being damaged by frost he thought the yield would have been 25 bushels It should make splendid hay Barootta Wonder had been grown for six years with good results. It was a fairly strong grower, with a slight tendency to shell, ripens early, and yielded 16 bushels after being knocked about by storms. It should make a good hay wheat. Gluyas was a splendid rust-resisting wheat, but owing probably to frost it was a partial failure with him this season Allora Spring was also a good yielder, but one of the worst wheats to go down that he had grown A lengthy discussion ensued, and it was resolved to place the wheats in the following order of preference:—Carmichael's Eclipse, Marshall's No 3, Gluyas, and Barootta Wonder.

Eudunda, February 1.

PRESENT—Messrs. Krummel (chair), Weil, J. A. and E. T. Pfitzner, and Schiller.

WHEATS.—Mr. E. T. Pfitzner tabled the following wheats:—Marshall's No. 3, clean and plump, no rust, yield 28 bushels per acre; Victorian Bluestem, rust on flag, yield 22 bushels; Smart's, yield 25 bushels, very slightly affected by rust. A sample of second growth of wheat, 3 ft. in height, and luxuriant growths of spear grass and saltbush were also tabled.

BUTTER PATS.—Members are of opinion that the adoption of uniform pats of butter by farmers was advisable.

Mount Bryan East, February 7.

PRESENT—Messrs. Dunstan (chair), Honan, Teddy, Thomas, Bryce, and Wilks (Hon. Sec.), and two visitors.

WHEAT EXPERIMENTS.—Mr. Bryce reported on experiments carried out last year. Twenty-two acres of fallow land, manured with 80 lb. to 90 lb. super per acre, and sown with 35 lb. to 40 lb. Purple Straw wheat per acre, averaged 22 bushels; while 20 acres of fallow alongside broadcasted with 50 lb. Purple Straw per acre, and not manured, yielded only 8 bushels per acre. Both crops suffered somewhat from rust. In 1901 he received about 2 oz. of Gamma wheat from the Bureau. The first season he got back only 7 oz., next year this returned 16 lb., and last season this was sown on half an acre of land manured with 75 lb. of super per acre, and returned 16 bushels of plump grain. The crop was quite free from rust, whereas Purple Straw on both sides of it was badly affected.

RUSTY HAY.—Mr. Teddy reported death of horse grazing in a paddock where a considerable amount of rusty hay was lying about. The horse suffered from severe scouring for several days.

SORGHUM.—Mr. Wilks tabled sorghum 5 ft. 7 in. high, grown on loamy soil, and not irrigated.

Watervale, February 1.

PRESENT—Messrs. C. A. Sobels (chair), Beck, Ward, Scovell, Ashton, Treloar, Holder, Perrin, Solly, Smith, E. E. Sobels, and Castine (Hon. Sec.).

EGGS FROM EGG-LAYING COMPETITION.—Members who obtained eggs from the Magill competition reported satisfactory results so far.

RUST-RESISTING WHEATS.—Mr. Ashton stated that three years ago he received from the Bureau 8 oz. Gamma wheat. This was sown and produced 22 lb. The next year he reaped 6 bushels, and this year, although sown too late to give it a proper chance, he reaped 60 bushels from 6 bushels of seed. It was a good yielder and rust-resisting.

POULTRY.—Mr H. Scovell read a short paper on this subject. Judging from the fowls seen on most farms many farmers apparently hold the opinion that one fowl is as good as another. This, however, was a great mistake, as, to make them profitable, fowls required just as much attention in respect to feeding and breeding as do horses, cattle, or sheep. For table purposes, a quick-maturing, meaty bird was required; for laying, one that will lay twelve dozen to fifteen dozen eggs yearly. Proper yards and houses were required. The warmer the hens are kept in winter the better will they lay. It was better to make a start in a small way and increase the flock as experience is gained. He found the Minorca a splendid layer. Crossed with the Orpington the result was very satisfactory, the chicks being hardy, and quick to mature. They were good table birds, and constant layers. The effect of a good rooster on the ordinary strain of farm fowls was very marked, but on no account should any but pure-bred roosters be used. In crossing in this way it was best to get a fresh rooster each year. As soon as the young cockerels are fit for table purposes they should be disposed of, as the longer they are kept afterwards the less the profit.

Millicent, February 4.

Present.—Messrs. McRostie (chair), Holzgrefe, Stuckey, Hart, Varcoe, Stewart, and Davidson (Hon. Sec.).

Rust-resistant Wheats.—Mr. Hart tabled samples of Marshall's No. 3, Majestic, Allora Spring, and Gluyas wheats. He found the first two splendid yielders, rust-resistant, and suitable to the district. He had not sufficient experience with the other kinds to speak of their qualities. The Secretary stated that one farmer sowed 2 bushels of Majestic wheat on four acres, and had reaped 112 bushels of good quality grain.

Dairy Instructor.—A motion regretting the resignation of Mr. Thomson was carried.

Standard Sample of Wheat.—The Hon. Secretary initiated discussion on this subject, and condemned the low standard adopted. He thought there should be two grades, and that the representatives of the farmers should fix the standard. A good discussion followed, most members disagreeing with the present method of fixing the standard.

Bleached Wheat.—Mr. Hart stated that his experience was that bleached wheat produced less flour and more bran than good sound wheat.

Cost of Growing Wheat.—Members estimate the cost of wheatgrowing in this district at £1 19s. 2d. per acre. A 20-bushel crop, at 2s. 6d. per bushel, would only leave a profit of 10s. 2d. per acre, whereas from dairying at least £2 per acre should be obtained in this district.

Wilmington, February 3.

Present.—Messrs. Slee (chair), Robertson, Schuppan, Bischoff, Lauterbach, Noll, Bauer, Hannagan, Broadbent, Sullivan, and Payne (Hon. Sec.), and four visitors.

Membership of Branches.—Mr. Robertson initiated a discussion on this subject, and after lengthy discussion it was resolved that it be a recommendation to the Council of Agriculture that one-third of the members of each Branch should retire annually, that candidates for the vacancies be proposed by the remaining members or by candidates themselves, that the election of new members be by ballot.

Harrowing after Drilling.—Mr. Schuppan asked whether it was beneficial to harrow the land after sowing seed with the drill; he had not found any benefit from the practice, except that it was to bury any seeds which might not have been properly covered by the drill. Mr. Noll had noticed little benefit from the practice, though, of course, the surface of the land was left smoother for harvesting machines. Members would like the opinions of members of Branches in districts where it is usual to harrow after the drill.

Second Crop of Wheat.—Mr. Slee tabled second growth of wheat from Willochra; the crop stands nearly 3 feet in height, and is out in ear. It is to be cut for hay, and a fair return is expected.

Officers.—The election of officers for the year resulted in the appointment of Messrs. W. Robertson, J. A. G. Lauterbach, and R. G. S. Payne as Chairman, Vice-Chairman, and Hon. Secretary respectively.

Baroota Whim, February 1.

Present.—Messrs. Flugge (chair), Raneberg, Spencer, Dahlenburg, and Hoskin (Hon. Sec.).

Rabbits.—The Chairman initiated a discussion on this subject. Most of the members favoured poisoning as the quickest and most effective way to deal with the rabbits, though the Chairman thought the use of traps would pay best, as the skins were of value, and would pay portion of the cost of the work.

Seeding.—Mr. Spencer thought in this district it was best to drill in the seed as early as possible after the end of March. Members agreed that on sandy land that was liable to drift it was best to drill in the seed, covering it to depth of three inches.

Narridy, February 8.

Present—Messrs. Nicholls (chair), Darley, Turner, Kelly, Freebairn, Lang, E. and W. R. Smart, and Dunsford (Hon. Sec.).

Johnson Grass.—Mr. Turner tabled vigorous growth of Johnson grass grown at the public school on light limestone soil. He found the fowls very fond of the leaves, which were green when all the natural herbage was dry. It was not advisable, however, to plant it on land that would be used for other crops, as it was exceedingly difficult to destroy. Members thought it worth trying as a summer fodder.

Finniss, February 1.

Present—Messrs. S. Collett (chair), T. Collett, Chibnall, and Henley (Hon. Sec.), and one visitor.

Thatching Haystacks. The Hon. Secretary read a paper on this subject. In the absence of roomy sheds, thatching the stacks was necessary. Some farmers will buy expensive machinery for cutting hay, and go to the expense of carting and stacking, and then will leave the stack exposed to all weathers for several months, the frequent result being that a lot of the hay is spoilt. The stacks should be properly thatched at the first opportunity. Rushes, broombush, or straw was generally used here. Where the former are easily obtained they make a good thatch. Broombush is all right until it dries, then the leaves begin to fall off, the wind blows a lot away, and the rain will penetrate. Besides, the leaves and stems are objectionable in the hay. He thought straw cut with the binder the best; it was easily obtained and very convenient to handle. Considerable discussion followed, members being agreed that more attention should be given to this matter.

Gladstone, February 6.

Present—Messrs. Rundle (chair), Goode, Greig, Smith, Tunbridge, Cook, McDonald, and Wornum (Hon. Sec.).

Rust-resisting Wheats.—Discussion on this subject took place. Marshall's No. 3, Gluyas, Carmichael's Eclipse, and Silver King were considered the best rust-resisting wheats for this locality.

Best Wheats for Hay.—Mr. Rundle read a paper on this subject. Of the various wheats he had grown he found Purple Straw, Marshall's No. 3, Rattling Jack, Red Straw, and White Tuscan the best for hay. Considerable discussion on the paper took place.

Carrieton, February 25.

Present—Messrs. Gleeson (chair), Manning, Steinke, Kaerger, Cogan, Martin, O'Halloran, Ormiston, Vater, and Bock (Hon. Sec.).

The Drought.—Mr. Cogan read a paper on the drought, its evils, and how to remedy them. A lengthy discussion took place.

Riverton, February 6.

Present—Messrs. A. J. Davis (chair), W. B. Davis, Gravestock, Cooper, Gray, Kelly, Calf, and Hussey (Hon. Sec.), and three visitors.

Rust-resisting Wheats.—Considerable discussion on this subject took place, and it was agreed that this season Marshall's No. 3 had proved the best all-round wheat. Majestic was also being tried extensively, and had proved a splendid wheat, and specially suitable for hay if cut moderately green. Silver King and Gallant had been grown experimentally, and promise well, being rust-resistant and good all-round wheats. Some Gallant crops went seven bags per acre.

Saddleworth, February 19.

PRESENT—Messrs. J. H. Eckermann (chair), Hannaford, T. Eckermann, Scales, and Coleman (Hon. Sec.), and one visitor.

STOOKING HAY.—Discussion took place on this subject. Members find that the more upright the sheaves are stood the better; if stood firmly on the butt the sheaf is nearly upright and will take but little damage from rain. The practice of past years of stooking sheaves on the flat is altogether condemned in this district, as there is too much risk of damage by rain.

RED RUST.—Discussion on rust-resisting varieties of wheat took place. Marshall's No. 3 is most extensively grown; Majestic is next in favour, is a better hay wheat, more resistant to rust, and reaps easier than No. 3; both are good yielders, strong straw, and hold the grain well. Neumann's Early, though somewhat rusty, produces good grain. A number of other kinds, not largely grown yet, promise well.

EARLY GREEN FEED.—For this purpose barley and rye were preferred by members. The latter, cut green and chaffed, and mixed with hay, makes good feed. The barley can be left later than rye, and will thus give a succession of crop.

Yorketown, February 13.

PRESENT—Messrs. Correll (chair), C. J. and A. E. Anderson, Latty, Koth, Domaschenz, and Newbold (Hon. Sec.), and one visitor.

WHEAT SAMPLES.—Members tabled samples of wheats grown by them, with a view to selecting the best for exhibition at the Adelaide Show. Owing, however, to the unfavourable harvest weather, none of them were of high enough quality. Members also thought the conditions of the competition involved too much trouble and financial risk.

RUST-RESISTING WHEATS.—Discussion on this subject took place.

Richman's Creek, February 1.

PRESENT—Messrs. Knauerhase (chair), J. H. and F. H. Lehmann, Mattner, H. Kelly, Gebert, Searle, J. S. and J. J. McSkimming, and J. M. Kelly (Hon. Sec.).

RED RUST.—Rust does not affect the crops to any extent, the district being too dry and early.

WEAK-STRAWED WHEATS.—Discussion on this subject took place, many of the crops having gone down badly during the rough weather. Petatz Surprise and Neumann's Early were the worst in this respect, while Purple Straw and Marshall's No. 3 proved the best to resist the effects of the wind.

EXHIBITS.—Samples of cucumbers, apples, and different native grasses were tabled.

Stansbury, February 6.

PRESENT—Messrs. Faulkner (chair), Sherriff, Jones, and Cornish (Hon. Sec.).

RUST-RESISTING WHEATS.—Discussion on this subject took place. Marshall's No. 3, Silver King, Majestic, and Gluyas were strongly recommended, being rust-resisting and good yielding wheats. Gluyas is considered the best early wheat grown here.

FARM IMPLEMENTS.—Mr. J. Sherriff read a paper describing the advancement made in various implements during the past fifty years, and urged the necessity for farmers using the most up-to-date labour-saving machinery, in order to produce their crops at the least possible expense.

SHEEP v. WILD OATS.—Members who formerly experienced great difficulty in keeping their land clear of wild oats state that by utilising sheep to feed down the growths their paddocks can now be got quite clean.

Minlaton, February 20.

Present—Messrs. Correll (chair), Martin, Boundy, Evans, B. W. and R. G. Newbold, A. and J. McKenzie (Hon. Sec.).

Deep v. Shallow Ploughing. Discussion on the question of ploughing the land when fallowing took place. It was unanimously agreed that where a limestone or rubble subsoil exists deep fallowing could not be recommended, but with greater depth of soil deeper cultivation may be advantageous.

Business.—It was decided that each member take it in turn to read a paper or initiate discussion. In the event of any member not being able to take his turn, he is to find a substitute.

Mount Gambier, February 13.

Present—Messrs. Dyke (chair), Mitchell, Wedd, Kennedy, Ruwoldt, Edwards, Watson, Williams, and Lewis (Hon. Sec.).

Dairy Instructor. A resolution expressing regret that the services of Mr. Thomson had not been retained by the Government was carried.

Late Crops. Mr. Wedd tabled some green oats in ear. Seed was sown during the last week in November, and the crop was freer from rust than those sown at the ordinary season. Mr. Edwards said that he had a crop of barley put in on shares in October, and this yielded 40 bushels per acre.

Rust-resistant Wheats. Discussion on this subject took place. The Hon. Secretary stated that as far as he could ascertain Marshall's No 3 was the only variety grown in the district that had resisted rust. Mr. Edwards stated that he had another wheat, Gamma, which was very resistant He sowed two bags of this, and reaped 39 bushels per acre There was not a speck of rust on it. Marshall's No. 3 had a little rust, but it did no injury. It yielded 32 bushels per acre. Mr. Ruwoldt got 35 bushels per acre from this variety, ut Dart's Imperial rusted badly, and only yielded about 17 bushels.

Kapunda, February 6.

Present—Messrs. Shannon (chair), Banyer, Kerin, Weckert, Byrne, Teagle, Harris, Holthouse, and Harris (Hon. Sec.).

Zante Currants Mr. Holthouse tabled two bunches of Zante currants. Two vines which formerly bore little fruit were rung this year, with the result that he gathered 3 cwt. of fruit.

Red Rust.—Mr. Teagle read a short paper on this subject. He appeared to hold the opinion that the resistance of any variety to rust depended entirely upon the date it was sown. Where it was planted early the wheat was developed and the straw hard, consequently the fungus had little opportunity of doing any damage. He thought therefore, that the protection against rust lay in sowing early wheats. He had found no variety really resistant Purple Straw sown early produced a good sample, whereas the same variety nearly three months later was badly pinched With King's his experience was similar, while Marshall's No. 3 developed rust, but heavy rains washed it off, and he reaped a good sample. Several members spoke of Marshall's No. 3 as resistant to rust, and one of the best for this district. Some rust was visible on the straw, but the grain was not affected. One member complained that it went down badly. The Chairman had noticed that some of the earlier wheats produced good grain, though rust was plentiful on the straw. He found Marshall's No. 3 resisted rust splendidly, even when late in developing and he was convinced that if the variety had been sown generally in the district the average yield would have been double what it was. He had found this wheat yielded just as well as the varieties usually grown, even in seasons when they were not troubled with rust, and he blamed the farmers, including himself, for sowing rust-liable wheat when they had equally as prolific resistant varieties available.

Clarendon, Febuary 8.

PRESENT—Messrs. Payne (chair), Harper, Phelps, J. and W. Spencer, Nicolle, Piggott, Juers, Morphett, Dunmill, and Wright (Hon. Sec.), and a number of visitors.

HOMESTEAD MEETING.—This meeting was held at the residence of Mr J. Piggott, for the purpose of seeing a new Blackstone oil engine at work. The visitors were pleased with the capacity for work shown by the engine, and Mr. Piggott was heartily congratulated on his enterprise. The homestead and garden were also inspected, and various points of interest discussed, after which the visitors were entertained at tea.

Kingscote, February 8.

PRESENT—Messrs. Turner (chair), P. T. and C. J. Bell, Nash, Carter, Melville, Olds, Neave, Wright, Bates, Whittle, and Cook (Hon. Sec.).

EUCALYPTUS OIL.—Mr. Melville read a short paper on the manufacture of eucalyptus oil, and some discussion ensued.

GRASSES.—A long discussion on grasses took place The Hon. Secretary reported that Paspalum dilatatum was doing well with him.

MALTING BARLEY.—Discussion on the subject of selling malting barley, and it was decided to ask the Chamber of Commerce to fix a standard for malting barley, as was done for wheat

Port Germein, January 30.

PRESENT—Messrs. Stone (chair), Hillam, Blesing, Kingcombe, Deer, Basford, McHugh, Thomas, Head, and Gluyas (Hon. Sec.).

WHEAT PRIZES AT ADELAIDE SHOW.—Members regret being unable to compete for these prizes, but they consider the condition requiring the exhibitor to keep 50 bags on hand absurd. Ten bags should be ample.

STANDARD SAMPLE OF WHEAT.—Discussion took place on the question of the standard sample, and the treatment of samples alleged to be under the standard.

Penola, February 13.

PRESENT—Messrs Stoney (chair), Peake, Morris, McKay, Miller, Alexander, McBain, Richardson, Ricketts, and Allnutt (Hon. Sec.).

DAIRY INSTRUCTOR —A resolution expressing regret at the resignation of Mr. Thomson and appreciation of his services was carried unanimously.

LADYBIRDS.—Discussion took place on the value of ladybirds, and the possibility of artificial means being adopted to keep up a supply of the insects.

FEEDING DAIRY COWS.—Mr. McBain read a paper on how to feed dairy cows in the Penola district. He considered the dairyman should grow feed throughout the year for his cows They could grow green crops to feed during the year as under:—January, maize; February and March, sorghum, April to end of July, rape; August to end of November, cocksfoot or native pastures. December, maize. He limited the variety of crop, as the dairyman should be able to do as much of the work as possible without employing additional labour. In growing these crops it will be necessary to use some super or bonedust All of the crops mentioned will grow to perfection in this district if properly treated. For maize the land must be well cultivated and brought to a fine tilth by the end of September, when the seed should be sown in rows 3 ft apart. Mix and sow per acre about 1 bushel of maize and ½ cwt. super. When the plants are three or four inches in height cultivate between the rows with the horsehoe, and repeat the operation when the surface of the soil begins to set or to crack. By the beginning of December the maize should be fit for feeding off, and should last two months. Land for sorghum must be prepared as for maize, and seed sown about the middle of September will be ready when the maize is finished. About the end of January break up the paddock that was under maize, work it down fine, and sow rape. If drilled 5 lb. per acre will suffice; for broadcast sowing, 10 lb. will be necessary. With the seed apply 2 cwt. per acre of super. In average seasons the rape will be fit to turn the cows on in April. The sorghum plot, having been treated the same as the other when fed down, and sown to rape, will carry the cows on until the end of July. For the next four months the animals will do best in a good grass paddock, half of which should consist of sown grasses. In feeding off the crops, fence off portions with light posts and single barbed wire, shifting the fence as the crop is eaten down. This will save waste resulting from the crop being trampled down, and will put it to best advantage

Morgan, January 30.

PRESENT -Messrs. Windebank (chair), Wohling, Hahn, Lindner, Hewitt, and Plummer (Hon. Sec.).

WEIGHING WHEAT. Members thought the small measures used by wheat buyers for ascertaining the weight of wheat did not give accurate results, and consider that a bushel measure carrying the Government stamp should be used.

RED RUST.—Mr. Wohling said Early Para was the only variety grown by him that was not affected by rust. Dart's Imperial and Purple Straw were reported to have been rotten with rust. Members wished to know whether Dart's Imperial is the same wheat as that known as Bluey. [Yes. ED.]

WHEAT NOT STANDING.—Members had noticed that whereas wheat that was only scarified in went down, that which was scarified and harrowed stood up. Mr. Hahn thought the way the seed was put in had a great deal to do with its standing against storms.

Onetree Hill, January 28.

PRESENT Messrs. J. Bowman (chair), Blackham, Blake, F. and G. Bowman, Flower, Ifould, Kelly, Thomas, and Clucas (Hon. Sec.).

THICK V. THIN SEEDING.—Some discussion on this subject took place. Several members reported favorably of results of thin seeding. One member had proved to his satisfaction that thin seeding was a mistake, and strongly recommended farmers not to stint the seed to save a few pence per acre. While it was admitted that small seed often gave good returns, members considered it advisable to only sow plump grain, as under adverse circumstances it was certain to do better than small seed.

GREEN FEED.—Lucerne growing has been a success this season. Johnson grass has done well, but farmers should not forget that it is nearly impossible to eradicate. It was considered a mistaken practice to drill in lucerne seed with any cereal crop. Ensilage was strongly recommended for dairy cattle

Lyndoch, January 28.

PRESENT—Messrs. Kennedy, Zimmermann, Schenke, Woolcock, Kent, Rushall, H. and W. J. Springbett, and Mitchell (Hon. Sec.), and two honorary members.

MANAGEMENT OF ORCHARDS.- Mr. James Woolcock read a paper on this subject. Dealing first with winter work, they had the subject of pruning, which was of the greatest importance. What they required was strong, well-shaped trees that would bear good crops of fruit evenly distributed, and protected from wind and the direct rays of the sun. Some trees naturally bear heavy crops, and the pruning, after securing a good framework, will be directed to reducing the bearing wood in order to secure larger and better fruit.

In addition, thinning of the fruit may also be necessary. On the other hand, some trees naturally run to wood, and the grower must treat these to encourage the production of fruit spurs. All prunings should be gathered together and burnt, and in August the trees sprayed with Bordeaux mixture for the prevention of fungus diseases. Ploughing should be finished before the warm weather sets in. As the trees show signs of coming into flower, a second spraying with Bordeaux mixture should be given. The soil should be kept well stirred through the spring and summer with the cultivator or chisel-tined harrows. About the end of October it will be necessary to summer prune peach trees making vigorous growth, otherwise the inside of the tree is too densely shaded, and the development of fruiting wood low down is prevented. Summer pruning, however, does not mean the indiscriminate lopping of the branches, but the judicious removal of the lateral growth in excess of requirements. Summer pruning of the pear and apple should take place late in the summer; the lateral growths made during the season should be cut back to three or four buds, in order to encourage the development of fruit spurs near the main branches. An important point in the management of the orchard is the marketing of the produce. He could not understand growers accepting such low prices for their soft fruits while there was such a demand for dried fruit. The cost of drying was not heavy, nor was it difficult for any one with ordinary intelligence to produce a good sample. It would pay far better to dry peaches, apricots, etc., than to dispose of them as fresh fruit at the prices ruling of late.

Show of Produce.—Owing to the adverse season experienced, it was decided not to hold the usual show of products of the district this year.

Colton, February 6.

Present—Messrs. Kenny (chair), Hull, and Packer (Hon Sec)

Red Rust and Takeall.—Marshall's No. 3 wheat was reported to have done well in this district, being practically free from rust, while other sorts alongside were quite valueless. Takeall has caused heavy losses Members attributed the trouble to early ploughing

Wandearah, February 1.

Present—Messrs. Collins (chair), Roberts, Dick, Davidson, Wall, Munday, Fernie, E. H. and E. J. Eagle (Hon. Sec), and one visitor.

Red Rust.—Considerable discussion on growing rust-resistant wheats took place Gluyas and Carmichael's Eclipse are largely grown in this district, and both prove good yielders and very resistant. Marshall's No. 3 has also grown fairly largely, but, while yielding well and resisting rust, is considered a little too late for this locality.

Balaklava, February 13.

Present—Messrs. Manley (chair), Anderson, Baker, Burden, Neville, Reid, Smith, Thompson, Thomas, and Black (Hon. Sec).

Ensilage.—Mr. Burden read a paper on this subject describing the method of making ensilage, and its value for dairy stock. Although ensilage required considerably more labour than the making of hay, it had been proved beyond doubt that the dairyman got better results from ensilage. In feeding it to cows he advised putting it in boxes and giving it after milking, in order to avoid the milk being tainted. He thought it paid best to grow crops specially for ensilage, and recommended a mixture of cereals and such crops as peas, mustard, or rape.

Pekina, December 26.

Present—Messrs. Talbot (chair), Penna, Fiddaman, and Simonds (Hon. Sec.), and three visitors.

Rust-resisting Wheats.—Discussion on this subject took place. The Chairman advised sowing a portion of the crop with rust-resisting wheats as a precaution, but he would not put in too much, as he found that generally without rust he got better returns from the ordinary wheats. He spoke very highly of Marshall's No 3, which, being medium late in coming into ear, escaped the frost, which was more to be feared than rust in this district. The Steinwedel, owing to its early ripening, usually escaped damage by rust. A visitor favoured Gluyas as being rust-proof and a good yielder. He sowed two bags of seed on 13 acres and reaped 15 bushels per acre, whereas Rattling Jack wheat alongside was nearly rotten with rust. Marshall's No 3 was slightly affected on the straw and flag, it gave a return of 12 bushels.

Oats.—Discussion took place on best oats to grow in this district The Chairman favoured Cape or Brown oats, but the Hon. Secretary considered Algerian better than the other two, as the husk was softer and the grain filled out better.

Golden Grove, January 28.

Present—Messrs Milne (chair), McPharlin, Maughan, Ross, Angove, Haines, Rawlings, N. J. and A D. N Robertson (Hon Sec)

Rust-resisting Wheats.—In this district Galland's Hybrid wheat, a variety introduced by the Agricultural Bureau a good many years ago, is most popular, being rust-resisting, a very heavy yielder, both of grain and hay. It grows 5 ft. 10 in. to 6 ft. in height in average seasons, but the grain is very hard. Majestic is the only other resisting variety grown, and is rapidly becoming popular here.

Harvest.—Members are of opinion that this district will average 14 bushels of wheat and 30 cwt. of hay per acre.

Local Shows.—Mr. Maughan read a paper on this subject, in which he advocated holding local shows of produce and stock by the Branches of the Bureau. Such shows would engender a keen spirit of rivalry amongst the producers, and would result in an improvement in stock, etc. The Chairman agreed, but Mr. McPharlin considered that it would be better to have agricultural shows in the larger centres and to have fewer shows than they now had.

Utera Plains, January 30.

Present—Messrs. Venning (chair), H. and R. J. West, Hahnhardt, Hale, J. Deer, J. Deer, jun., Jacobs, A. R. S. and A. R. Ramsey (Hon. Sec), and three visitors.

Ploughs.—Mr. W. Hale read a short paper on this subject. While he considered the paring plough suitable for the work it was originally intended to do, he thought farmers often used it where another plough was wanted. For soft land or for skimming the fallows, where the farmer has not got a cultivator the paring plough was very useful. He thought for hard land they would be improved by using weights. On the whole, however, he considered the ordinary ploughs better, as they loosen the lower soil somewhat. He had got 3 bushels per acre more on land ploughed with the ordinary plough than from land alongside ploughed with the paring plough. Where they were using the drill it was necessary to plough deeper than they could do it with the paring plough. True, many farmers had got good crops on land broken up with these ploughs, but he had also secured good results where the scarifier was used Still, he would not advocate the use of the scarifier in place of the plough. He admitted the ordinary plough required more strength of teams than the paring plough, but it was better to have 100 acres well ploughed than 150 indifferently done. The majority of the members differed from Mr. Hale, favouring the paring plough except in the hills or on stiff soil.

INDUSTRY.

SUPPLIED BY THE DEPARTMENT OF INDUSTRY.

Labor Bureau.

Number of persons registered and found employment by Government Departments and Private Employers from January 27 to February 26, 1904.

Trade or Calling.	Number Registered		Number Employed.
	Town	Country	
Laborers and youths	76	140	415
Masons and bricklayers	1	—	1
Carpenters	3	—	1
Plasterers	3	—	2
Painters	1	—	3
Boilermakers and assistants	1	1	10
Blacksmiths and strikers	2	—	—
Fitters and turners	2	—	2
Moulders	—	—	2
Coppersmiths	—	1	—
Brassfinishers	2	—	—
Electrical engineers	1	—	2
Crane drivers	—	—	1
Well sinkers	—	—	1
Wardens and porters	1	—	2
Cooks	2	1	—
Apprentices	17	4	—
Cleaners	6	3	18
Porters and junior porters	12	6	1
Rivet boys	1	—	—
Totals	131	156	461

February 27, 1904

A Richardson, Bureau Clerk

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No 9. APRIL 1, 1904. Vol VII

AN ENQUIRY INTO SOUTH-EASTERN CONDITIONS.

By Arthur J Perkins Secretary for Agriculture

(Continued from pages 307, 349, 382, and 429)

CRITICAL EXAMINATION OF INDIVIDUAL SOILS

(Continued)

3. Mount Gambier Black Loam (Mr Ruwoldt's Farm)

The characteristics that have already been ascribed to the sample of soil obtained from Mr Sinclair's farm are in most respects repeated here The natural fertility of this soil is unquestionably great, and reference to an earlier article (page 347) in which are detailed the returns Mr Ruwoldt has reaped from it, will serve to show that good farming has taken every advantage of the free gifts of Nature

The analytical data having reference to this soil are summarised in Table XIII —

TABLE XIII

Analytical Data	First six inches	Second six inches	First foot
	%	%	
Proportion of fine Earth	98 3	98 1	—
Moisture retained after air drying	2 15	3 15	—
Relation of Carbon to Nitrogen	10 0	12 7	—
	lbs per acre	lbs per acre	lbs per acre
Total Nitrogen	4,372	1,820	6,192
Total Phosphoric Acid	2,602	1,820	4,422
Potash soluble in strong Acid	2,844	2,519	5,363
Lime soluble in dilute Acid	6,078	5,074	11,152
Available Phosphoric Acid	195	162	357
Available Potash	439	309	748
Organic matter	97,240	51,350	148,590

As in Mr. Sinclair's soil, we have to note here an unusually high proportion of fine material, which may be looked upon as offering an exceptionally large surface to root action, and enabling plants to take full advantage of the substances that might be in an available condition as plant food. Judging roughly from the amount of moisture retained after air-drying, neither soil nor subsoil is highly retentive of moisture The relative advantages or disadvantages of this fact in districts with a heavy rainfall have already been adverted to elsewhere.

In total quantities of nitrogen and phosphoric acid Mr. Ruwoldt's soil is abundantly provided. Of nitrogen it contains nearly twice and of phosphoric acid over 1¼ times as much as is usually accepted as indicative of average fertility There is to be noted, on the other hand, an apparent deficiency in potash soluble in strong acids, and a heavy deficiency in lime. Judged simply from the standard of *natural fertility*, Mr. Ruwoldt's soil is perhaps not quite as rich as that of Mr. Sinclair How it compares with the latter from the point of view of *condition*, dependent exclusively on past farming operations, is a question that may be brought to light in the sequel.

We have referred to the abundant supply of nitrogen, and we may conclude that, generally speaking, under a rational system of farming, expensive nitrogenous manures are not likely to prove remunerative It is inferred thereby that nitrates will probably be present when most required. When cereal follows cereal this is hardly likely to be the case, and it is probable that in such circumstances heavy agricultural crops will not be obtainable without the aid of nitrogenous manures Whether, on the other hand, their adoption will prove remunerative, is purely a matter of local experience

When dealing with Mr Sinclair's soil I adverted to the fact that the relation of carbon to nitrogen may generally be looked to as furnishing fairly reliable indications as to the *condition* or acquired fertility of the land in one direction at all events Every farmer is conversant with the fact that, however great the natural fertility of any piece of land may be, it is always exposed and, generally through defective practice, to lose condition, i e, to become incapable of carrying the full crops that might, under better farming, be expected of it Similarly and conversely, a soil that is naturally poor may, by judicious farming, be raised to a high state of temporary fertility, during the course of which its yields will compare favourably with those from soils of far greater natural fertility Judged from our standards of time, natural fertility may be considered as almost inexhaustible Condition or acquired fertility, on which mainly depends the value of the crops is purely a matter of treatment Good farming will maintain it and even raise it bad farming will soon destroy it It has generally been noticed that in exhausted, badly farmed lands the ratio of carbon to nitrogen is low, i e there is proportionately more nitrogen than carbon and generally speaking, this nitrogen does not readily become available to plants In Mr Ruwoldt's land, both in soil and subsoil, we find, for a light soil, an exceptionally high ratio of carbon to nitrogen, and had we not before us the record of a succession of good heavy crops, we could still have inferred from chemical data alone that the land has been thoroughly well farmed From the latter point of view Mr. Ruwoldt's soil, though of somewhat lesser natural fertility, is in better condition than the one previously considered

Whilst the total amounts of phosphoric acid present are fairly heavy the amounts available are by no means excessive It is probable that phosphatic dressings may tend to profitably increase yields, particularly in view of relative deficiency in lime, if applied in the form of Thomas phosphate, I understand from Mr Ruwoldt that he has in the past found advantage in using bonedust

Potassium oxide and lime are both relatively deficient and it might be suggested that trial dressings of both potash manures and lime be applied to the land. On the potato crop, at all events, it is probable that the former will give satisfactory results

4. SOIL FROM GLENCOE.

This is new land, having been under potatoes in 1902-3, with a yield of from 10 to 17 tons, and under grain in 1903-4

The analytical data having reference to it are summarised in Table XIV·—

TABLE XIV

Analytical Data	First six inches	Second six inches	First foot
Proportion of fine Earth	87.7	90.0	
Moisture retained after air drying	3.3	2.68	
Relation of Carbon to Nitrogen	11.9	13.4	
	lbs per acre	per acre	lbs per acre
Total Nitrogen	3,608	2,324	5,932
Total Phosphoric Acid	1,820	1,382	3,202
Potash soluble in strong Acid	1,885	1,820	3,705
Lime soluble in dilute Acid	5,964	4,778	10,742
Available Phosphoric Acid	114	49	163
Available Potash	244	162	406
Organic matter	95,615	69,405	165,020

I have heard it stated that the occupiers of the new Glencoe land look upon it as even superior to the best Mount Gambier land. Judging from the sample under consideration, this is very far from being the case. In natural fertility it is distinctly below that of either Mr. Sinclair's or Mr. Ruwoldt's land. In total nitrogen it shows 5,932 lb. per acre as against 9,377 lb. and 6,192 lb. in the Mount Gambier soils, in total phosphoric acid, 3,202 lb. as against 5,558 lb. and 4,422 lb., in potash, 3,705 lb. as against 6,289 lb. and 5,863 lb. It is, nevertheless, true that during the opening years heavier crops of both cereals and tubers may perhaps be secured on this new land than are at present obtained on some of the Mount Gambier lands. It should be remembered, however, that much of the Mount Gambier land has been allowed to become foul with weeds and eel worms, nor is it always in the high condition of active fertility that follows the adoption of the best farming practices.

These remarks notwithstanding, the Glencoe soil is unquestionably good soil, though perhaps not quite as good as is anticipated in some quarters. Of nitrogen it contains 1 4-5 times as much as any good average soil, whilst in phosphoric acid it barely comes up to standard requirements. On the other hand, both in potash and lime there is apparently a marked deficiency. At the same time, the amounts of both phosphoric acid and potash at present available are considerably below those of the Mount Gambier soils. It is probable, however, that in the course of time a good system of tillage will tend to raise these figures. The ratio of carbon to nitrogen is higher than in any of the other soils that have been considered. This fact is accounted for on the grounds that the soil is practically virgin soil, in which have accumulated to a considerable extent various organic debris falling on its surface. It is probable that tillage will tend to lower this ratio in the near future.

The Glencoe soil is considerably coarser than the Mount Gambier soils, but to no greater extent retentive of moisture.

5. Soil from Kingston

This is a soil that was sent to the School of Mines two years ago for analysis, and on which I was at the time asked to report. The data of the analysis are by no means as complete as those already given for other South-Eastern soils. They are summarised in Table XV.

TABLE XV

	First Foot lb. per acre
Total nitrogen	6,533
Total phosphoric acid	1,170
Potash soluble in strong acid	19,240
Lime soluble in weak acid	183,275
Available phosphoric acid	65
Available potash	1,007

This soil is characterised by an amount of nitrogen about double of that of standard average soils; by about three times as much potash and lime; but by only small quantities of phosphoric acid. It may be noted further that only infinitesimal quantities of this latter substance were in available form at the time of analysis. The soil may be described as rich in all substances necessary to plant life, with the exception of phosphoric acid. The probable advantages to be reaped from the use of phosphatic manures are, therefore, pretty evident.

6. Reclaimed Millicent Soil.

This soil, in conjunction with the two remaining ones, was forwarded me for examination and report by Mr. G. S. Kempe at the beginning of last year. He pointed out that it was liable to drift, and thought that the adoption of an active manure, by inducing rapid growth, might minimise the evil.

The analytical data are summarised in Table XVI. Unfortunately, as in the preceding case, they are not as complete as those having reference to the earlier soils:—

TABLE XVI.

Analytical Data.	Soil.	Subsoil.	First foot.
	lbs. per acre.	lbs. per acre.	lbs. per acre.
Total Nitrogen	47,125	14,788	61,913
Total Phosphoric Acid	2,893	1,414	4,307
Potash soluble in strong Acid	1,349	5,330	6,679
Lime soluble in dilute Acid	139,263	185,250	324,513

This soil is remarkable chiefly for the very high proportion of nitrogen which it contains. A good average soil may be taken to contain approximately 3,250 lb. per acre in the first foot, whereas we have here 61,913 lb., or over nineteen times as much! Even for a peaty soil these figures are very remarkable. Whether or not this nitrogen is in available form is a question which could only have been settled by a closer examination than I was at the time able to give this soil. The organic carbon was not estimated, hence it is difficult to get at the amount of organic matter present, except by a roundabout calculation. If we assume that the ratio carbon to nitrogen is represented by 10, a figure below that of the Tantanoola peat, we should have 619,130 lb. of carbon per acre, representing 1,875,844 lb. of organic matter per acre of 3,250,000 lb. Little wonder that such soil should be liable to drift when in a comparatively dry state.

Both in total phosphoric acid and potash this soil is slightly above standard requirements, and in view of the large amount of organic matter present it may reasonably be assumed that both are present in fairly available form.

7. Light Fern Land from Mount Gambier.

Mr. Kempe was impressed with the vast areas of this type of land in the South-East lying comparatively idle, and wished to know whether an analysis would hold out any hopes as to their future utilisation.

More or less incomplete analytical data having reference to this soil are summarised in Table XVII.:—

TABLE XVII.

	First Foot.
	lb. per acre.
Total nitrogen	1,468
Total phosphoric acid	325
Potash soluble in strong acid	618
Lime soluble in dilute acid	2,275

That this soil is poverty-stricken in every line is fairly evident. As might be expected, it shows best in nitrogen, arising from the decomposition of organic matter, leaves, etc., on its undisturbed surface. But even of this substance it contains no more than half the quantity characteristic of our typical soil. Under the influence of the plough and our usual methods of cultivation what little organic matter might at present be found on the surface would in a soil of so light a texture soon disappear after the first few crops. Of phosphoric acid and potash it contains no more than one-tenth of what we have assumed to be the normal requirements of a good average soil. This soil is also exceptionally poor in lime.

On a soil deficient in practically everything that is requisite to good vegetation agricultural operations are faced with many difficulties. Nevertheless, in the more densely populated portions of the globe, it is quite true that soils equally poor have been turned to profitable use. I propose dealing with this question from a general point of view later on. It may be stated here, however, that the use of leguminous crops as green manures is all indicated to meet the case. This practice, aided by the judicious feeding of stock, will in the end confer some agricultural value on this type of soil.

8. SECOND-GRADE MOUNT GAMBIER LAND, FROM GULLIES.

Of this soil Mr. Kempe says that it carries heavy crops of grass that are not, however, of fattening quality. It is rather heavy, and situated generally on a limestone bottom.

Figures relating to the analysis are summarised in Table XVIII. --

TABLE XVIII.

	First Foot lb per acre.
Total nitrogen	3,283
Total phosphoric acid ..	1,170
Potash soluble in strong acid	19,210
Lime soluble in weak acid .	4,833

We have here a soil coming up to average requirements in nitrogen, abundantly provided with potash, and relatively deficient in both lime and phosphoric acid. It is probably the relative deficiency of these two substances that renders the grass somewhat innutritious. The use of phosphates is certain to be followed by good results

Having examined in detail several typical soils of the South-East, I propose in future numbers discussing other questions of interest that derive from them.

(To be continued.)

CIDER-MAKING.

[Cider-making is an industry that has, in my opinion, a good future before it in the apple-growing districts of South Australia. No beverage is more refreshing or pleasanter during the hot summer months; and, in view of its low alcoholic strength, none perhaps is better adapted to the requirements of all classes of the community. I have no doubt but that were it obtainable here of uniformly good quality and condition, and retailed at moderate prices, it would speedily displace the many artificial summer drinks upon which we are at present obliged to fall back. Moreover, cider-making is the natural complement of apple-growing on a large scale. There is perhaps no country in the world in which apples are grown over extensive areas that does not make cider of a kind. Our apple industry, even at the present time, represents an important national asset: we dream of its rapid extension in the near future. There is no doubt that in the course of time cider-making must be associated with it; first perhaps, with a view to utilising waste fruit, but ultimately to supply a beverage, which, once known at its best, need fear the competition of none other.

Requests for information as to the best methods of making cider are constantly reaching me. Now, as the subject can hardly be adequately treated in the course of a letter, and as we have nothing in print on the subject, my replies have generally been somewhat vague and unsatisfactory. In 1903 the Board of Agriculture of England published a pamphlet on the subject summarising the work done in this direction by Mr. F. J. Lloyd, under the auspices of the Bath and West and Southern Counties Agricultural Society. As this work embraces in a simple form most questions connected with cider-making, I propose reprinting it in a series of articles in *The Journal of Agriculture*, for subsequent issue as a pamphlet, which can be issued at a moderate price to all those requiring information on the subject.—A. J. P.]

RESULTS OF INVESTIGATIONS BY F. J. LLOYD, F.C.S., F.I.C.

INTRODUCTION.

The object of science is to teach men how to control, so far as may be possible, the forces of Nature. It is evident that before we can control them we must thoroughly know and understand what these forces are and how they work. It is by studying these natural agents, and then by showing men how to control their effect in the industry with which they are concerned, that science becomes of practical value. Probably no industry depends so much upon natural forces as does that of agriculture; hence no industry should derive greater benefit from science. And this is especially true of that branch of agriculture—the Cider Industry.

Cider is the fermented juice of the apple. There are two varieties. Sweet cider, so called because it has a sweet taste, for fermentation has proceeded only slightly, and much of the natural sugar of the juice is left in the liquid; and dry cider, in which fermentation has proceeded so far that but little of the original sugar remains.

Cider made in one district will differ materially from cider made in another district, and that made on one farm will differ from that made on another farm in the same district. Indeed, when these investigations were first started it was even difficult to find two or three barrels in the same cider-house which were alike. Uniformity of product is essential to success in all industries, and therefore such a state of affairs was very unsatisfactory to those who were interested in cider-making. No man in England has done more to really promote the cider industry than Mr. R. Neville Grenville, of Butleigh Court, Glastonbury, and how the experiments on which I have now to report were started is best told in his own words taken from an admirable article entitled: "Some Practical Hints on Cider-making," which was published in the journal of the Royal Agricultural Society of England in 1901 —

In 1893, the Migratory Cheese School of the Bath and West of England Society was being held on one of my farms at Butleigh, and Mr. F. J. Lloyd, under whom it was carried on, kindly consented to keep his laboratory going after the Cheese School was over, and to turn his attention to the scientific examination of the cider problem. The following year, 1894, I induced the Bath and West of England Society to take the matter up in earnest, and from then until now they have carried on the scientific part of the experiments at Butleigh, I undertaking to provide the apples and the necessary plant for the work. The Board of Agriculture latterly helped the Society to the extent of £100 a year.

The results of these experiments were published each year in the journal of the Bath and West of England Society. The same subject thus became mentioned in various years, and the information was disconnected and intermittent. At the request of the Society I have prepared for the Board of Agriculture the following consecutive account of the work done. It does not pretend to be more than a re-arrangement of my previous reports. Although I have not attempted to make it a treatise on cider-making, but have confined the report almost entirely to the work done at Butleigh, yet it covers most of the ground of cider-making.

Some see or pretend to see in these experiments no other result than that they have impressed upon all cider makers the necessity of cleanliness. To say that cleanliness is essential to success in cider-making is merely to utter a platitude. It is a simple expedient on the part of those ignorant of detail to hide their ignorance under a general principal. Undoubtedly the secret of success in cider-making, as in dairying, is cleanliness. But while it is easy to say this it is very difficult to realise what this cleanliness is and how it may be best attained. Numerous precautions are required, many of which at first sight seem almost unreasonable. Cleanliness is necessary in the orchard, in gathering, storing and grinding the fruit, and in pressing the pomace. It is necessary in handling the juice, in storing it, and in purifying it from sediment. Needless to say, it is necessary in every article with which the cider comes in contact in the cider-making and storing rooms, and in the people who have to deal with the manufacture. To arrive at the perfection of cleanliness has been a constant effort of the experiments at Butleigh. But even after some years of work we have not yet discovered all the ways in which cleanliness can be observed. To realise the conditions which make for cleanliness has been one of the main objects of the experiments, and how this has been done will be fully stated in this report. But to explain what cleanliness is, and whence uncleanliness comes, how to remedy it, and how best to treat cider in which, from want of cleanliness, certain injurious changes have taken place, is the work of the scientist, and is as yet scarcely trodden ground.

In the course of my experiments it soon became evident that the final product—cider—depended for its character on three great factors.

1st—The composition of the apples and the juice obtained from them.

2ndly—The methods of manipulation and apparatus employed in making the cider; and

3rdly—The fermentation which takes place in the juice.

All these have been studied; what seemed to be improvements have been introduced, and the changes which take place and which in the past were, one may say, absolutely uncontrolled, can now be, and, by the best makers are, carefully controlled. Where before good cider was a chance product, it is now the result of carefully controlled action. In fact, an attempt has been made to lift the manufacture of cider out of the rut of rule of thumb, and to make it a scientific industry.

People who will not take a little trouble to make good cider had better give up cider-making altogether. They destroy the reputation of cider, they cannot sell what they make, and those who drink the stuff they produce would be better in health without it. Such cider-makers will learn too late that they have allowed an opportunity to slip which will not return How true this is may be best shown from the following facts· Large quantities of apples were sold in Somerset in 1897 which were taken to France for the manufacture of cider. How was it that the French cider-maker could afford to buy apples in Somerset at a price which presumably paid the Somerset farmer better than converting them into cider? It was simply because many Somerset farmers have not learnt how to make a drink which can compare in quality with that made by our neighbours across the Channel If this continues what will be the result? The demand for cider, which is growing rapidly in England, will induce the French cider-maker to put upon the English market a drink more suitable to the tastes of the public than that made at home, and if once the foreigner gains the favour of the consuming public English makers will be unable to oust their more enterprising rivals

I believe that with careful attention to the facts and advice given in this report cider-makers will be able to compete with any foreign imports, and that, if well made, cider will become a national beverage

FREDK. J. LLOYD

THE CONSTITUENTS OF APPLES AND APPLE JUICE.

An apple consists, from the practical cider-maker's point of view, of two parts, juice and marc, or solids not in solution. If the whole of the soluble constituents are extracted, only about 4 per cent of solids remain; but in ordinary cider-making, by one pressing it is seldom possible to extract more than 75 per cent. of the juice, and by subsequent second treatment about 10 per cent., so that the marc always contains some of the juice. In an unripe apple the proportion of juice is less. The marc then contains substances (pectin compounds) which during ripening gradually change into soluble compounds and enter the juice, thus increasing its value for cider, and also changing its character. Hence the necessity of using ripe apples

The most important constituent of the juice is sugar. Two kinds of sugar are present, grape sugar and cane sugar. But as both of these are fermentable, their presence has more of a scientific than a practical interest, hence in using the word sugar one refers to the total quantity present.

The acidity of the juice is due to an acid known as malic acid. The quantity of this acid present in apples varies according to the kind of apple. In the juice of some it amounts to over one part per cent. In the juice of others to only 0.1 or 0.2. The quantity present also varies according to season, as may be seen from the average analyses of the juice from press, p. 495 and this variation does not appear to correspond in any way with the other constituents. Thus in 1893 and 1894 the average acidity present in the juice of six varieties of apples was the same (see p. 491); yet the solids varied greatly, being 15.7 per cent. and 10.7 per cent. respectively. There is a very widespread opinion that the natural acidity of the apples is much greater in a poor season than in a good one. The results of experiments prove this opinion to be erroneous. But it is found that the apple juice during a poor, wet season has a tendency to become acid rapidly, and this has probably given rise to the above opinion.

Tannin is the third substance of importance. It has the property of precipitating albumin, and so helps to clear the juice. Its strong, astringent flavour is marked in some varieties of cider-apples, and also in cider made from such apples.

The juice contains some soluble pectin compounds, a little albumin, and other substances. In this report these taken together are called "extractives," their distinct character not having as yet been determined.

A small quantity of mineral matter is also present in solution in the juice.

The Analysis of Apples, Apple Juice, and Cider.

The quality of cider depends mainly upon two great factors: first, the original composition and condition of the apples and the apple juice; and secondly, the fermentation which takes place in the juice. Before we can satisfactorily discover what are the many causes which influence the composition of the apples and the juice obtained from them, we must have some means of estimating analytically the composition of the juice.

The following system has been adopted in these investigations:—Six to ten apples are carefully weighed, and the weight divided by the number of apples taken. This gives the average weight of each apple. The apples are ground in a small machine—a kind of modified sausage machine having been adapted for the purpose. No very satisfactory machine has yet been found. The pulp is placed in a small hand press, such as is used for pharmaceutical purposes, and the juice extracted and weighed. This press is also faulty, as it is difficult to ensure the same pressure being applied to each sample. A press is wanted the screw of which works in a lever, from the end of which a definite weight is suspended. The pulp would then always be submitted to the same pressure, and if this acted for a definite period the results would be as uniform as could be expected.

The nature of the pulp which remains, and how this varies at different periods in the growth of the apple, has been to a slight extent examined; but the investigation presents many difficulties. A good description of the substances present in this pulp, and the changes which take place in the ripening of fruit, will be found in Dr. N. Graeger's "Obstweinkunde."*

The analysis of the juice is conducted as follows.—It should be first strained through a moderately fine cloth or muslin. The specific gravity represents the weight of a given volume of juice when compared with the same volume of distilled water. In writing and print it is nearly always abbreviated to Sp. Gr. The temperature of the juice should be exactly 60 deg. F. If it is not, then either the juice must be brought to this temperature or a correction made for the temperature by means of a table or by calculation. The most accurate method of estimating the Sp. Gr. is to fill a bottle known to hold exactly 100 grammes, or 1,000 grains, of distilled water with the juice to be tested, and then to carefully re-weigh. The juice, instead of weighing 100 grammes or 1,000 grains, will be found to weigh, say, 106.55 grammes, or 1065.5 grains. If the temperature is 60 deg. F., then the Sp. Gr. of the juice is 1.0655. But if the temperature is not 60 deg. F., then a correction is made. The most simple correction, and one which is fairly accurate, is when the temperature is below 60 deg. F. deduct from the fourth figure of the specific gravity as many points as the temperature is below 60 F. For example: the temperature is, say, 50 deg. F., or 10 deg. below 60 deg. The gravity shown is 1.0655, and from this deduct 10, leaves 1.0645, which is the true Sp. Gr. at 60 deg. F. When the temperature is above 60 deg. add, instead of deducting, the points which represent the difference in temperature. Thus if the temperature is 65 deg. F. we have:—

Gravity shown	1.0655
Add for temperature	5
True gravity	1.0660

A more simple and nearly as accurate method of estimating the gravity is by means of the hydrometer. This instrument should be called the gravimeter; in America it is called the densimeter. The stem contains a scale graduated from 1,000 to 1,100, and showing 100 divisions. This only gives the gravity to the third decimal place, and, therefore, corrections for temperature are more difficult to make, but can be made as above described by first adding another 0 to the result obtained and then correcting.

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* Published by B. F. Voigt, Weimar, 1895.

In taking the gravity of liquids they should be as clear as possible and contained in a glass cylinder which leaves ample scope for the hydrometer to rise and fall. The hydrometer must be clean, free from grease, and the upper part of the stem dry. It should be inserted into the liquid until nearly as deep as it will subsequently fall; thus, if the gravity is supposed to be about 1.060 insert to 1.050 and then let go. It will fall below the 60, then gradually recover itself, and come to rest. The line which corresponds with the surface of the liquid will represent the gravity. Thus, if it rest at 61 then the gravity is 1.061. Owing to froth it is sometimes difficult to read from above, the hydrometer can then be read from below.

The gravity of the juice is, by some makers, taken by the saccharometer, an instrument the same shape and used in the same way as the hydrometer, but graduated, and supposed to show the percentage of sugar in the juice. The results obtained with this instrument were found to be most unsatisfactory. As the solids of the juice are composed of several constituents besides sugar, the saccharometer is unreliable.

A fairly accurate guide to the amount of solid matter in the apple juice may be obtained with the simple hydrometer by the following formula: Sp. Gr. × 234 − 234. Thus, if the specific gravity be 1.06, multiply by 234 = 248.04, deduct 234 = 14.04, which will be very nearly the percentage of solid matter present in the juice of the apple. The result obtained is not absolutely accurate, being slightly low with a rich juice and slightly too high with a poor juice. But for practical purposes this simple method will be found useful.

The solids are more accurately estimated by evaporating 5 cubic centimetres to dryness on a water bath and drying the residue at 100 deg. C. (212 deg. F.), for a definite time, viz., six to ten hours. I find by experiment that it is not possible to obtain the solids absolutely dry, for if continuously dried they lose weight constantly for several days. It was therefore thought better to carry out a uniform system rather than attempt to obtain an absolute result.

The acidity of the juice is determined by means of a standard solution of alkali, each cubic centimetre of which is equivalent to 0.01 grammes of malic acid. The indicator used is litmus paper, for the colour of the apple juice prevents any change in a liquid indicator being seen. The apparatus is exactly similar to my acidimeter, now so largely used by cheesemakers. It consists of a graduated burette into which the standard solution of alkali is poured up to the zero mark. Ten cubic centimetres of apple juice or cider are placed in a white porcelain dish and the soda solution gradually added from the burette. The cider changes colour as the acid becomes neutralised. If the glass rod which is used to stir the cider in the dish is brought in contact with a small strip of blue litmus paper it will make a red mark where it touches the paper, but as the acidity gets neutralised by each addition of alkali each new mark gets fainter and fainter, until at last no red can be seen. The acidity of the liquid has been neutralised. If the number of cubic centimetres of alkali used is now noted, this will show the acidity Thus, if 3.5 cubic centimetres have been taken, then the acidity is 0.35 per cent.

The sugar.—There are present in apple juice as least two varieties of sugar—grape sugar and cane sugar. If the sugar is estimated in the juice by Fehling's method or Pavy's modification thereof, the grape sugar only is shown. In order to estimate the total amount of sugar it is necessary to convert it all into one variety by heating the juice with dilute hydrochloric acid (1 per cent.) for thirty minutes. The total sugar, including that which is thus "inverted," is then estimated by means of Pavy's modification of Fehling's solution. By deducting from this total sugar the amount of grape sugar originally found, we obtain by difference the cane sugar.

The tannin is by far the most difficult substance to estimate, and at present the methods at our disposal for the purpose are not very satisfactory. However, it was necessary to adopt some method, and, after many experiments, the most suitable method appeared to be that of Neubauer. A standard solution containing 0.785 grammes of permanganate of potash per litre is employed. Tannin has the power of decolourising the solution. To determine the exact point of complete decolourisation a solution of indigo is added to the juice as an indicator. The estimations are made as follows:—5 cubic centimetres of apple juice are taken for examination; to these are added 5 cubic centimetres of indigo solution of such a strength that the 5 cubic centimetres will be decolourised by exactly 1 cubic centimetre of permanganate solution. Next 5 cubic centimetres of dilute (1 in 10) sulphuric acid are added, and the whole is made up of distilled water to 200 cubic centimetres. To this liquid the standard solution of permanganate is carefully added until the blue colour of the liquid disappears. The quantity of permanganate required (less the 1 cubic centimetre required by the indigo) gives the amount which has been decolourised by the tannin. In these determinations it is assumed that the tannin present in the apple juice has the composition $C_{14}H_{10}O_9$, and that 1 cubic centimetre of the permanganate solution is decolourised by 0.001 gramme of tannin. The strength of the permanganate solution must be checked by experiments on pure tannin.

The alcohol is estimated in 100 c.c. of the cider to which a quantity of carbonate of lime has first been added sufficient to neutralise all the acidity. This is necessary, as otherwise volatile acids would come over. About 70 c.c. of liquid is distilled, the distillate made up to 100 c.c. brought to 60 deg. F. and its specific gravity accurately determined in a 50 c.c. bottle. The percentage of alcohol present is found by means of the following table:—

Table for the Estimation of Alcohol (Stevenson).

Sp. Gr of Distillate.	Alcohol by Weight	Alcohol by Volume.	Sp Gr. of Distillate.	Alcohol by Weight.	Alcohol by Volume.	Sp Gr of Distillate	Alcohol by Weight.	Alcohol by Volume.
·9880	7·10	8·80	·9890	6·40	8·00	·9900	5·75	7·15
·9881	7·00	8·75	·9891	6·35	7·95	·9901	5·70	7·05
·9882	6·95	8·65	·9892	6·30	7·85	·9902	5·65	7·00
·9883	6·90	8·60	·9893	6·20	7·80	·9903	5·60	6·95
·9884	6·80	8·50	·9894	6·15	7·70	·9904	5·50	6·85
·9885	6·70	8·40	·9895	6·10	7·60	·9905	5·54	6·80
·9886	6·65	8·35	·9896	6·00	7·55	·9906	5·40	6·75
·9887	6·60	8·30	·9897	5·95	7·45	·9907	5·30	6·70
·9888	6·55	8·15	·9898	5·90	7·40	·9908	5·25	6·60
·9889	6·50	8·10	·9899	5·85	7·30	·9909	5·20	6·50
·9910	5·15	6·40	·9920	4·50	5·65	·9930	3·90	4·90
·9911	5·05	6·30	·9921	4·45	5·55	·9931	3·85	4·85
·9912	5·00	6·20	·9922	4·40	5·50	·9932	3·80	4·80
·9913	4·95	6·15	·9923	4·35	5·40	·9933	3·75	4·70
·9914	4·90	6·10	·9924	4·25	5·30	·9934	3·65	4·65
·9915	4·80	6·00	·9925	4·20	5·25	·9935	3·60	4·55
·9916	4·75	5·95	·9926	4·15	5·20	·9936	3·55	4·50
·9917	4·70	5·90	·9927	4·10	5·15	·9937	3·50	4·45
·9918	4·65	5·80	·9928	4·00	5·05	·9938	3·40	4·30
·9919	4·55	5·70	·9929	3·95	5·00	·9939	3·35	4·25

Sp Gr of Distillate	Alcohol by Weight	Alcohol by Volume	Sp Gr of Distillate	Alcohol by Weight	Alcohol by Volume	Sp Gr of Distillate	Alcohol by Weight	Alcohol by Volume.
·9940	3·30	4·15	·9950	2·75	3·50	·9960	2·15	2·70
·9941	3·25	4·10	·9951	2·70	3·40	·9961	2·10	2·65
·9942	3·20	4·00	·9952	2·60	3·30	·9962	2·05	2·60
·9943	3·15	3·95	·9953	2·55	3·20	·9963	2·00	2·50
·9944	3·10	3·85	·9954	2·50	3·15	·9964	1·95	2·45
·9945	3·00	3·80	·9955	2·45	3·10	·9965	1·90	2·40
·9946	2·95	3·75	·9956	2·40	3·00	·9966	1·85	2·30
·9947	2·90	3·70	·9957	2·35	2·90	·9967	1·80	2·20
·9948	2·85	3·60	·9958	2·30	2·85	·9968	1·75	2·15
·9949	2·80	3·55	·9959	2·20	2·80	·9969	1·65	2·05
·9970	1·60	2·00	·9980	1·05	1·30	·9990	0·55	0·65
·9971	1·55	1·95	·9981	1·00	1·25	·9991	0·45	0·55
·9972	1·50	1·85	·9982	0·95	1·20	·9992	0·40	0·50
·9973	1·45	1·80	·9983	0·90	1·10	·9993	0·35	0·45
·9974	1·40	1·75	·9984	0·85	1·05	·9994	0·30	0·40
·9975	1·35	1·70	·9985	0·80	1·04	·9995	0·25	0·30
·9976	1·30	1·65	·9986	0·75	0·90	·9996	0·20	0·25
·9977	1·25	1·55	·9987	0·70	0·85	·9997	0·15	0·20
·9978	1·20	1·45	·9988	0·65	0·80	·9998	0·10	0·15
·9979	1·20	1·40	·9989	0·60	0·70	·9999	0·05	0·05

A rapid method of estimating the alcohol which is of value where large numbers of samples have to be analysed quickly, as at shows, may here be mentioned. It is not absolutely accurate but if carefully carried out gives fairly accurate results. It is based upon this fact: The specific gravity of a sample of cider depends upon two factors, the percentage of solids in solution which raises the gravity and the percentage of alcohol which lowers it. If the specific gravity of the cider is taken, then the alcohol evaporated off by boiling the liquid down to about one-third its volume, making up to the original volume, and again taking the gravity the difference between these two gravities is due to the alcohol. But the alcohol cannot be determined simply by deducting the one gravity from the other. The method of procedure is as follows:—

Divide the specific gravity of the cider by the specific gravity of the liquid left after evaporating the alcohol, the resultant or quotient represents the specific gravity of the alcoholic distillate which has passed off. By the table on p. 488-489 it is easy to discover what percentage of alcohol this represents. The following is an example of this method. The original cider had a gravity of 1·0369, the liquid left after evaporating the alcohol had a gravity of

1.0422. By dividing the former by the latter we obtain the result, .9949; which, by our table, represents 3.55 per cent. of alcohol by volume.

By distillation this cider yielded 3.60 of alcohol by volume, showing that the method is fairly accurate.

If the solids in cider were of uniform composition we could determine by calculation what would be the specific gravity of the liquid freed from alcohol from the solids. I find that this cannot be done with absolute accuracy, but the following formula has given very satisfactory results, where S. represents the solid matter per cent., then:—

$$\text{Specific gravity of cider freed from alcohol} = 1.0100 + S - 2\,[.0039]$$

For example, a cider contains 7 per cent. of solids, the gravity of the liquid when freed from alcohol would be.—

$$\begin{array}{r} 1.0100 \\ 7 - 2 = 5 \times .0039 = \quad .0195 \\ \hline 1.0295 \end{array}$$

A table may be made to represent the gravity equivalent to each per cent. and decimal of a per cent. of solids.

The albumin may be precipitated in the clear liquid by bringing this to nearly boiling point. It is then filtered off on a tared filter and weighed. The solution is then evaporated to a small bulk and alcohol added. This precipitates the pectin. I have found these determinations difficult and unsatisfactory.

The solids are burnt over a low flame. It is not easy to obtain a good white ash.

THE DETECTION OF PRESERVATIVES

The detection of salicylic acid in cider presents some difficulty

Attempts to trace this acid were first made on the residue left after distilling the alcohol, by making this slightly acid and extracting with ether. The ether solution took up colouring matters and also tannin, or similar compounds, and the characteristic colour reaction given by salicylic acid with ferric chloride solution could not be obtained. Several solvents, both alone and combined with ether, were tried, but only rarely could any colour reaction be obtained, and then it was not a satisfactory one A series of experiments on cider to which definite quantities of salicylic acid had been purposely added proved that all the usual methods failed in detecting its presence. It then occurred to me that it might be possible to distil the salicylic acid in a current of steam, and an experiment proved that when it was present in considerable quantity sufficient came over for the distillate to give the characteristic colour with ferric chloride solution. My next experiments were directed to discover whether the salicylic acid could be thus obtained without passing steam through the liquid, but by merely boiling. The results were satisfactory.

Hence the method adopted was to take 100 c.c. of cider, make alkaline with soda, and distil off the alcohol (50 c.c. is sufficient). The residue was then made acid with sulphuric acid, and distillates of 10 c.c. taken off and marked 1, 2, 3, 4. These were tested with 1 per cent. solution of ferric chloride It was then found that sometimes the first distillate, or even the first two, would not show any colour reaction, but only the third, or perhaps the fourth, and it soon became evident that this depended on the quantity of salicylic acid present.

Quantitative experiments were next made, and when operating on 100 c.c. of liquid the following results were obtained:—The presence of 1 part of sodium salicylate in 10,000 parts of cider could be detected in the first distillate generally, and certainly in the second; the presence of 1 part in 20,000 was visible in the second or third distillate, and of 1 part in 30,000 in the third or fourth distillate. If present in smaller quantities it could not be detected when working with 100 c.c., though by concentrating a larger bulk of cider it would be possible to detect even smaller quantities. However, as five grains to the gallon can be found with certainty, and as less would scarcely act as a preservative, it is seldom necessary to work on a larger volume than 100 c.c.

In 1900 this method was applied to the samples exhibited at the show at Bath. To my surprise no less than 20 out of 84 exhibits gave the colour reaction of salicylic acid. Without letting the exhibitors know the result of my analyses, one or two were questioned by the steward as to whether they had not used some preservative or anti-ferment. They so stoutly denied having done so that it was decided not to take any action, and mainly for two reasons. It was thought first that it might be possible for salicylic acid to be naturally present in apple juice, and secondly that my method of analysis might be faulty, or the results be due to some substance other than salicylic acid. Repeated examinations have been made of cider known to be genuine, and I have not been able to find any salicylic acid naturally present in apple juice, nor produced by fermentation in juice which was known to be free from added matter. It was possible that other compounds might produce the same reaction as salicylic acid, therefore experiments were made to determine whether this were so.

Phenol, which itself gives a somewhat similar reaction, when added to cider, even in comparatively large quantity, and distilled, gives no colouration. Saccharin, which can be decomposed and produces salicylic acid under certain conditions, might possibly be so decomposed by the treatment with soda. Experiments have proved that this is not the case. I then tried whether fermentation proceeding in a liquid containing saccharin might bring about decomposition, but after fermentation these samples were tested, and no salicylic acid could be discovered. To make quite certain that I had left no possible means untried of proving the substance which I had found in these exhibits to be salicylic acid, I wrote to Professor H. Armstrong, F.R.S., who suggested that the bromide compound might be examined. This substance crystallises in a very characteristic manner, and I found that even in most dilute solutions, like these distillates, the crystals were formed, and could be centrifugally separated and distinguished when examined under the microscope. One somewhat interesting fact was observed during the continuance of these observations, namely, that solutions containing salicylic acid are liable to decomposition by the growth of certain fungi, and that in due course the whole of the salicylic acid disappears.

The Seasons—1893 to 1902.

1894.—A late frost in the spring cut off the blossoms of the apple trees, and so caused the apple crop to be exceedingly small. The year was one characterised by little sunshine and much wet. Two results followed the want of sunshine and the excessive rains; one was that the apples during October and November did not properly ripen on the trees, and the other that it was not possible to store them in hurdle stores, to ensure subsequent ripening. The effect of the bad season on the composition of the apples was very marked, as may be seen from the following table:—

Composition of Apple Juice.

Variety.	1893.			1894.		
	Sp. Gr.	Solids.	Acid.	Sp. Gr.	Solids.	Acid.
New Cadbury ..	1·0574	14·0	·16	1·0415	9·14	·16
Tom Hooper	1·0632	15·4	·72	1·0520	11·38	·70
Red Jersey .	1·0680	16·5	·20	1·0470	10·72	·19
Kingston Black .	1·0680	16·5	·32	1·0500	11·34	·44
Royal Somerset . .	1·0550	13·5	·60	1·0435	9·48	·71
Gins	1·0750	18·1	·39	1·0526	12·06	·23
Average .	1·0644	15·7	·40	1·0477	10·70	·40

The amount of total solids in the juice was no less than 5 per cent. lower in 1894 than it was in 1893. This 5 per cent. is sugar. Hence the juice from which the cider had to be made in 1894 contained one-third less fermentable material than in 1893.

The next point to be noted is that the average amount of acid present in these apples is the same in both years.

1895.—This was a better year than 1894, but not so good as 1893, as regards conditions favourable to the apple crop. The season was a plentiful one, and the apples were of fair quality, better than in 1894, but not so good as 1893. This is seen from the table on p. 495, which gives the average composition of the juice from the press for the ten years during which the observations have been in progress, and these figures prove that in 1895 the quality of the apple juice in bulk fell considerably below that of 1893.

1896.—This year was characterised by bright sunshine, a high temperature, and an exceptionally small rainfall. There was only a small apple crop The season was an early one, that is to say, the apples ripened sooner than usual. The apples yielded less juice per 1,000 lb. weight than was obtained in 1895. Thus, in 1895, 1,000 lb. of apples yielded 650 lb. of juice, while in 1896, from the same weight of apples, only 615 lb. of juice were obtained. But if the juice was less in volume it was better in quality, as shown in the table of average composition of juice from press, p 495. The composition of the juice was nearly as good as in 1893 with respect to total solids, and was better than in 1893 in not being quite so acid How much better it was in 1896 than in 1895 may be estimated by comparing the average specific gravity of the apple juice from each "cheese" made in these years This in 1895 was 1.0584, in 1896 it was 1.0625. In other words, in 1895 the juice contained about 11 per cent. of fermentable sugar capable of yielding 5½ per cent. of alcohol; in 1896 it contained about 13 per cent fermentable sugar, capable of yielding 6½ per cent. of alcohol.

1897.—The characteristics of the season were a more than average amount of sunshine, especially during the month of October, an exceptional rainfall in August, a low temperature combined with a large rainfall in September, and an exceptionally high temperature in October The effect of the season upon the apple crop varied greatly in different localities, in some districts the crop being very small. The effect at Butleigh may be gathered from the following figures:—

The total volume of juice yielded was about 3,000 gallons, as compared with 1,000 gallons in 1896 and 9,000 in 1895. The yield of juice per 1,000 lb. of apples was 616 lb., as compared with 615 lb in 1896, and 650 lb. in 1895 The characteristic of the apple juice in 1897 was a high percentage of acid, while the total solids were higher than in 1895, but below those of 1893 and 1896.

1898.—This was a season of very small rainfall, warm air temperature, and varying sunshine. The effect of the season upon the yield of apples was injurious, there being a much smaller yield than the average. As regards the quantity of juice which these apples yielded the effect was not striking. 1,000 lb. of apples yielded 621 lb. juice, which is only 6 lb. more than was obtained in 1896, and 5 lb. more than was obtained in 1897 The average quality of the juice was better than in 1897, though not so good as in 1896 or 1893. The apples of 1898 were all much smaller than in 1897 or 1896. These apples in most cases also produced a smaller percentage of juice. Hence the quality of that juice was, as a rule, better than in 1897.

1899.—The period of growth of the apple crop in 1899 was both dry and warm, there had been no frosts in the early part of the season to destroy the blossoms, and the result was a fairly good crop. The weather was such as to ensure the apples being fully ripe. For not only was the period of bright sunshine very considerably above the average, but the air temperature during the months of August and September, in which months probably the greatest development of the apple occurs, was also far above the average, in spite of the heavy rainfall of the latter month. The combined result of these conditions was more marked upon the composition of the apples than upon the quantity of the crop. The apples yielded not only more juice but juice of better quality than in any former year of the observations. Thus, as regards the quantity of juice, 1,000 lb. of apples yielded 654 lb. of juice. This was the highest recorded yield of juice since 1895, when it was first estimated. In that year the yield was 650 lb., while in 1896, 1897, and 1898 it was only 615, 616, and 621 lb. respectively. The quality of the juice was also better than any which had been obtained since 1893; this is somewhat remarkable considering the volume. In 1895 the large volume of juice was of poor quality, with a specific gravity of only 1.052. But the average specific gravity of the juice during the season 1899 was 1.061, which is even higher than that of 1893. The high proportion of solids in the juice was accompanied by a small proportion of acid. Thus, the season of 1899 yielded a juice of exceptional quality, which resulted in the production of excellent cider.

1900.—The chief characteristic of the season was the small amount of rain during July, August, and September. Then came a heavy rainfall in the month of October, which caused the fruit to fall on to the damp soil amid the leaves of a rapid autumnal change. The want of moisture in the early part of the season seemed to check the growth of the apples, and they remained, and were at the time of being gathered, exceptionally small. As a rule small apples yield a rich juice. But this year was an exception; the juice was not so rich as one would have expected.

The average composition of the juice from press was slightly below that of 1899. The apples yielded a high percentage of juice, 1,000 lb. of apples giving 692 lb of juice, the highest proportion yet recorded. Some of the apples used in this experiment were in fair condition, but the majority, like most of the apples that season, were undoubtedly moist, and this may partly account for the high proportion of juice. That the effect of the season upon the apple crop is marked, irrespective of district and variety, is well shown by the following extract from a letter sent me by Mr. H. L. T. Blake, of Fairfield, Bridgwater: "The summer of 1899 was very hot and dry, and in consequence of there being no rain when or after the fruit was forming, there was no natural thinning of the crop. The apples, therefore, in many orchards were thick in clusters on the trees, and were very small in size. Notwithstanding that, they ripened well, and in the thirteen cheeses I put up in 1899 the specific gravity of the juice as it came direct from the press averaged 1.068. On referring to my notes for the year 1900, I find that although the summer of 1900 was as hot and dry as 1899, the specific gravity of the juice of last year's apples, though grown from the same orchards, ranged from 1.052 to 1.060, representing an average of only 1.057, as compared with 1.068 in 1899." The season, therefore, had more marked effect on the apples at Fairfield than on those at Butleigh.

1901.—The season was one of small rainfall, with high temperature, and during the months of April, May, and June of more than usual bright sunshine. Towards the end of the ripening season there was, however, less sunshine than there had been during the previous two years. The apples, consequently, ripened more slowly than had been expected, and the crop was not large.

The total yield of the apples at Butleigh was about 6,000 gallons of juice. The apples on an average were not quite so small as in 1900, but individual varieties varied greatly in size as compared with former years, some being much smaller, others much larger. The percentage of juice was high when working on the bulk, 1,000 lb. of apples yielding 690 lb. of juice. It will be seen that while the specific gravity of the juice was not so high as in the two previous seasons, it was as high as it had been since 1893. The most marked peculiarity of the juice was its low acidity.

The following tables summarise some of the most important factors regarding the seasons during which the experiments were conducted:—

Rainfall—Inches over or under Average.

—	1893.	1894.	1895.	1896.	1897.	1898.	1899.	1900.	1901.	1902.
July	+ 1 29	+ 1·79	— 0·08	— 1·38	— 1·54	— 2·77	— 1·73	— 1·84	— 1·47	— 0·87
August .	— 1·05	+ 0·27	+ 0·08	— 0·88	+ 3·18	— 0 38	— 2·20	— 0·41	— 1·32	+ 0.24
September .	— 1·69	— 0 67	+ 1·91	+ 2·01	+ 0·67	— 1·90	+ 0·98	— 2·29	— 0·46	— 0·94
October . .	— 1·18	+ 0·68	— 0·26	— 0·89	— 2·47	+ 1·84	— 0·90	+ 0·40	— 1·33	— 1.06

Air Temperature—Degrees Fahr., above or below Average.

July ..	+ 1·85	— 0 10	— 0·2	+ 0·9	+ 2·6	0·0	— 1 2	+ 2·7	+ 2·6	— 2·0
August	+ 3·5	— 1·3	— 0·05	— 1·5	+ 0.9	+ 2·5	+ 2·8	— 0·1	+ 0·2	— 1·0
September .	— 0 3	— 2·05	+ 4 55	— 0·2	— 1·7	+ 3·8	+ 4·4	0 0	+ 0·8	— 1·5
October ..	+ 1·0	+ 1·15	— 3·4	— 2 8	+ 3 3	+ 4·5	+ 2 3	+ 2.7	+ 1·6	+ 1.6

Bright Sunshine—Hours above or below Average.

July ...	— 12·2	— 37·0	— 3·9	+ 19·6	+ 48·1	+ 44·7	+ 50·9	+ 82 7	+ 12·6	+ 9·9
August .	+ 42·9	— 61·4	— 10·2	+ 6.0	— 3·6	— 5.9	+ 115·8	+ 20 9	+ 29 1	— 46·3
September .	+ 22 8	+ 7·0	+ 77·1	— 42·6	+ 7·7	+ 56 7	+ 57 0	+ 36·0	— 29·8	+ 20·4
October ..	+ 20·2	— 21·2	— 6·0	+ 4·8	+ 29·3	— 26·1	+ 30·5	+ 31 2	— 16·9	— 26·2

THE INFLUENCE OF SEASON ON APPLES AND THE APPLE CROP

Upon this very large and intricate subject it is only possible to make a few statements which at present seem justified from the observations at Butleigh. The composition of the apple is greatly affected by the season, but how and why is a problem whch I have not as yet attempted to investigate. I here point out some of the evidences of this effect because the subject is worthy of investigation. So also are the changes in composition due to locality; that is to say, due to soil, as distinct from climatic conditions. Not that we can alter either the one of the other; but the more thoroughly we understand the processes of nature the more mastery we shall obtain over the products which are the results of such processes. The yield or crop varies from year to year. Most people may have noticed that, as a rule, an exceptionally prolific year of any one fruit, like the apple, is followed by a season of exceptional scarcity. The apple crop of 1896 confirmed this general rule, for while 1895 was a most prolific year, in 1896 many cider makers found a difficulty in obtaining sufficient apples to make any cider at all. The same is true of individual apple trees. As a rule, those which yield heavily one year yield but slightly the following year. Hence, in estimating the value of a particular variety of apple the yield of that variety cannot be determined upon the result of one season only, but requires that the average of several should be taken. The chief cause of a small crop has been a late frost in the spring, as in 1894. The second cause would appear to be a dry season, and inability of the trees to obtain sufficient moisture or sap to fully form the apples.

THE COMPOSITION OF THE JUICE VARIES ACCORDING TO THE SEASON.

This is best seen by the following table, showing the average composition of the juice obtained at Butleigh from practically the same orchards year after year:—

Average Composition of Juice from Press.

Year.	Number of Samples.	Sp Gr.	Solids.	Acid.
1893	6	1 060	14·40	·63
1894	11	1 050	11·14	60
1895	13	1 052	12·24	46
1896	5	1 057	14·02	40
1897	5	1 053	13·26	68
1898	5	1 056	13 62	51
1899	14	1 061	15·57	·44
1900	54	1 059	—	—
1901	12	1 057	14 43	·34
1902	8	1 047	11·43	·53

Want of sunshine towards the end of the season causes the apples to ripen slowly, so delaying the manufacture, and also tends to diminish the crop. This was noticed in 1901, as compared with 1899 and 1900. If this lack of sunshine is accompanied with heavy rain the apples do not appear to ripen properly on the trees. This was remarked in 1894. It is probably best under such conditions to gather the apples and ripen them in store. In 1902 the low temperature and want of sunshine not only prevented the apples from ripening, but caused the juice to contain a larger proportion of "extractives" than in any former year.

Passing from the crop as a whole to individual varieties of apples, it would appear that the season does not affect all varieties of apples alike, a season suitable for one variety is not suitable for another. Many illustrations of this fact may be found by studying the analyses in the appendix. It is also well illustrated by the following facts: The apples Kingston Black, New Cadbury, and Butleigh No. 14 yielded in 1898 a juice of higher specific gravity than in 1899, while Chisel Jersey and Red Jersey apples did the reverse. Evidently, the cider maker in any attempt to improve his orchards by reducing the number of varieties of apples must not overlook this important consideration.

Apples of the same variety and from the same tree vary each year (1) In average size or weight; (2) in the proportion of the juice which they yield; and (3) in the gravity of the juice. It is somewhat remarkable that the proportion of juice does not appear to depend upon the average size, for small apples will at times give a large, at other times a small, proportion of juice. Most frequently the gravity of the juice appears to increase as the size of the apple decreases, but this is not invariable. Thus, while in nearly all instances the average weight of the samples in 1898 was below that of the same variety in 1897, yet in many cases the composition of the juice of these smaller apples was almost the same as that of the larger apples produced in 1897.

(To be continued.)

BOTS IN HORSES.

By S. S. Cameron, M.R.C.V.S., Veterinary Surgeon to the Department of Public Health, Victoria.

Bots, whch are the larvæ of the horse bot fly (*Gastrophilus equus*, fam. *Œstridæ*), or, as it is sometimes called, the horse bee, are responsible for a so-called disease of the stomach of horses, but it is doubtful whether they at any time and under any circumstances of numbers cause more than a mild derangement of the stomach lining, such as may be indicated by a harshness and dryness of the coat, scurviness of the skin, and seldom, if ever, by graver symptoms.

The manner of infection of the horse's stomach may be gleaned from the following short description of the bot fly and its

Life History.

The female fly, which is about the size of or slightly smaller than an ordinary worker bee, deposits the ova or eggs in the spring of the year on the long hairs growing on the under side of the horse's jaw, behind and below the knees, on the fetlock, or on any part that can be easily reached by the horse with his mouth. The eggs adhere to the hair, as do louse "nits," by means of a gummy secretion deposited at the same time. They are about the same size, and resemble greatly the eggs comprising the "blow" of the blow fly. Their presence on the hair seems to be felt by the animal, and, just as a fly or other insect in contact with the human hair is mechanically annoying, and is quickly brushed aside by the hand, so the horse with his mouth attempts to get rid of those bot eggs by rubbing with his lips and biting the hairs to which they are attached, or by rubbing the jaw against the feed box. During this process, or, in the latter case, during subsequent feeding from the box, some eggs are gathered into the mouth and swallowed along with the saliva and food In the stomach, or, as is held by some naturalists, when in contact with the warm juices of the mouth, or even before being taken into the mouth, the eggs develop into larvæ or maggots. When mature the larvæ are from ½ in. to ¾ in. in length and bluntly spindle-shaped They have a segmented or banded covering (thirteen segments) of a yellowish or dirty-white colour, and very much resemble a large, over-grown blow fly maggot. At the anterior extremity they are provided with a pair of horny hooks, by which they attach themselves and hang on to the mucous lining of the gullet side of the stomach They are never found attached to the true digestive lining of the stomach, but only to that of the mascerating or storing division, and this fact is not sufficiently borne in mind when the untoward effect of bots on digestion is being unintelligibly enlarged on. The larvæ do not suck blood, but subsist on the mucus secretions and juices, which are somewhat increased by the slight irritation their presence causes. Statements to the contrary notwithstanding, it may be taken as a fact that they never perforate the wall of the stomach, and probably the greatest harm that can be attributed to them is that their presence, demonstrated on post-mortem examination, affords to bush quacks an easy way of accounting for the death of horses which have succumbed to causes which they cannot discern.

The larvæ remain in the stomach attached in the manner described for a period of some months' duration, and when fully grown their hold is loosened and they are passed along the bowels and excreted with the fæces. By worm-like motion they penetrate into the heap of dung or into loose earth, but in a few hours after expulsion all movement ceases, and the outer covering hardens into a horny shell (pupa case) of a dark brown, glistening colour. They remain dormant in this pupa or nymph stage for from thirty to forty days, at the end of which time the change to maturity is completed, and the perfect fly (imago) emerges. "In this perfect state, with their mouth atrophied, the œstridæ appear to be no longer able to take food; they may live, nevertheless, for several weeks on the fat accumulated in their bodies. Quiescent until their reproductive organs have attained their maturity, they then exhibit an extreme vivacity, particularly if atmospheric conditions are favourable. They fly chiefly during the warmest and finest days of summer and during the middle of the day, and they generally frequent pastures in the vicinity of woods" (Neumann). After fertilization by the male, which occurs shortly after birth, the females deposit their ova in the situations previously mentioned while on the wing, hovering just a moment while depositing a single egg and soon returning to repeat the operation, perhaps hundreds of times on the same horse, "which does not appear to be disturbed by the operation" (Neumann).

In connection with the latter statement the question has been recently asked: "Do bot flies sting?" The answer is "No," for the reason that they have no stinging apparatus, and their atrophied mouths forbid such a proceeding as biting. How, then, is it to be explained that horses exhibit such a terror of them, as is described by some correspondents to the press? Perhaps the story of the German physicists may apply here. A number of illustrious savants had met and puzzled deeply for days on the problem as to why water in a brimful vessel would overflow if a dead fish was placed in the vessel and would not overflow if a live fish was added, when it occurred to one of them to make a practical experiment, which proved ocularly that the water overflowed the bowl in either case, so that they had been discussing a false proposition. I think it probable that the correspondents referred to are also putting forward a proposition that is false, and that if careful watch were to be kept it would be found that the insect which causes terror in the individual and panic in the mob of horses is not the quiet, egg-depositing bot fly, but is the humming, blood-sucking gad fly, or its Australian prototype, whose phlebotomic operations horses, cattle, and even man may justly dread.

Summarised, the life history of the bot fly in Australia is as follows - The eggs are laid in the summer months from November to March, and are taken into the stomach within a few days. The larvæ remain in the stomach until the following spring August and September- when they are naturally ejected with the excrement. For four to six weeks following this ejectment they lie dormant in the ground as pupæ or nymphæ. From October onwards the sexually mature flies are hatched, and the life cycles is recommenced by the females, whose activities are always lessened during cool or tempestuous weather. It will be obvious that new districts may become infected with bot flies by the removal to them, during the winter months, of bot-infested horses.

PREVENTION.

As has been indicated, the ill-effects of bots in the stomach have been enormously exaggerated, but any harm they do cause will be increased in ratio to the number of bots present, so that it may be advisable to adopt measures to prevent deposition of the eggs and their absorption into the stomach. Regular grooming is most effective to this end, and the clipping or pulling out of the long hairs under the jowl and behind the knee and fetlock of horses at grass is to be recommended. The application of greasy substances to the parts most affected by the female fly for egg-laying will not prevent egg-laying, which, as previously mentioned, does not require that the fly should rest on the hair, but it will lessen the chances of the eggs being gummed to the hairs. Kerosine or phenyl emulsions, carbolic or eucalyptu oils, or any composition having a like pungent and pentrating odour appears to repel the egg-laying female, and horses so treated frequently escape infection even if the eggs are laid, as they are in great measure deterred from mouthing the parts.

These measures only apply to prevention in the individual horses treated. For the subjugation of the pest throughout a district the only rational method is to destroy the parasite when in the pupa or shell stage by burning the droppings of all horses in which signs of the maggots have been observed. This should be persisted in throughout the months of spring, during which it is known that the larvæ are naturally expelled.

TREATMENT.

The stomach bots are so firmly hooked to the stomach walls during their sojourn there, and their covering is so impervious to the action of ordinary medicinal agents, that vermifuge medicines are found to be practically ineffective. When their administration is followed by the expulsion of bots it is usually more than likely that is is merely a co-incidence, the bots having been sufficiently ripe to loosen, and come away according to the natural ordering. At all events it is usually in the spring when larvæ have been seen in the dung that worm medicines are used and that they appear to do any good. The talk about wthholding food from the horse and then administering some poison nostrum which the bots in their hunger are supposed to seize on with avidity is so much claptrap.' Under such treatment it is the horse that is hungry, not the bots. They do not live upon or absorb the free contents of the stomach, but, as previously stated, they obtain their sustenance solely from the juices of the tissues to which they are attached. As to the likely effect for good or harm of strong corrosive poisons, the laconic reply of Mr. Edward Stanley, Government Veterinarian for New South Wales, to a shepherd correspondent who enquired whether arsenic would kill intestinal worms, may be quoted. He confined his answer to three words, which ran—"Yes; sheep also!" It is perhaps not sufficiently understood that what may be deadly poison to an animal may be simply "clover" to the parasites it is harbouring. A draught of 1 to 2 oz. of turpentine to a pint of linseed oil is a favourite remedy given on an empty stomach, but its efficacy is largely problematical. Great success in expediting the expulsion of bots is said to follow the administration of bisulphide of carbon. This treatment, which was first introduced by Perroncilo, the Italian veterinary surgeon, consists in giving capsules containing from ½ to 1½ drams (30 to 90 grains) of carbon bisulphide every two hours for sixteen hours, food having been withheld from the animal overnight. Where capsules cannot be obtained, the carbon bisulphides should be dissolved in double the quantity of sulphuric ether, and given in a half-pint of fluid as a drench.

For the unthriftiness and indigestion which may accompany infection with bots, iron and vegetable tonics are most effective. Their administration should be continued for some little time in the form of a powder mixed with the food twice a day, and consisting of a dram each of powdered sulphate of iron and gentian and 2 drams of Jamaica ginger.—*Pastoralists' Review.*

ROSEWORTHY AGRICULTURAL COLLEGE NOTES.

FARM.

By J. D. TOWAR, PRINCIPAL AGRICULTURAL COLLEGE.

The principal work of the past month has consisted in tilling the fallows, which, owing to the abundant summer rains, became quite weedy. We began sowing phosphate on the 21st where oats are to be broadcasted later. We expect to keep the drill going from now until the seeding is finished. Briefly planned Ebsary's A will be sown to varieties of wheat, Ebsary's B to oats, and C to barley, Nottle's to varieties of wheat, and No. 5 to fertiliser experiments. The list of varieties of wheat will be enlarged and a few rust-resistant sorts will be tried.

Some of last year's experiments will be repeated, and a few new ones tried, plans of which will appear in a later report.

PIGS.—The College has now more swine in the breeding and feeding pens than it has had for several months. We are fattening some forty-five on wheat and Cape barley, and have several fine young boars and sows to sell for breeding.

SHEEP.—The flock is in splendid condition, though the pastures begin to look very bare. We will lack for a sufficient number of fields in which to draft the various lots in lambing time. The farm is in need of a drafting yard of a good up-to-date model, with a capacity for 600 to 1,000 sheep, and before settling on a plan we shall be glad to inspect models or receive suggestions from any one with new ideas on the subject.

CATTLE.—The cows are getting silage now from the unweighted silo, and while good silage has so far come forth, it is too early to state just how successful the experiments will be.

EXPERIMENTAL VINEYARD.

By H. E. LAFFER, SUPERINTENDENT OF VINEYARD.

Vintage is now completed, and the wines are all safely in cask. The crop of grapes was good and the fruit was well matured. Altogether the vintage totalled 5,400 gallons, this amount being the greatest that we have made so far. The weather was so cool that there was very little need of cooling.

After pressing the skins we resorted to leaching them with water in order to extract the remaining alcohol for distilling. Five tanks were built for the purpose, each 3 ft. x 3 ft. x 3 ft. The result was satisfactory, there being about 500 gallons of liquid to send to the still. The strength averaged about 8 per cent. absolute alcohol.

The vines have made good growth, and have apparently made up for what they lost in the previous year. Though the water was available for the young trees we had only to use it once, the rains having kept the soil moist through the summer. Nursery stock is looking well, and much of the young stock has been worked.

The currant crop was very satisfactory, and 5¼ cwt. of dry fruit was obtained. The sample was very good. The vines are scattered, so we cannot estimate the area. Table grapes were fine this year, and as soon as they were ripe a constant supply was kept up at the College.

Birds proved a great nuisance again, the starlings being present in great numbers. A number of bird-scarers protected the bulk of the vineyards very well, but in outlying spots the vines were entirely stripped of fruit. This pest is a problem with which vignerons will have to deal in the near future.

RAPE.

By J. D. Towar, Principal Agricultural College.

Mr. H. A. Lyons, of Wild Horse Plains, asks the following questions about rape:—

1. Time for sowing.
2. Quantity of seed per acre.
3. Will English super do as a fertiliser?
4. Depth of sowing
5. Whether to sow on wet or dry ground.

Although a number of articles and notes on Rape have occurred from time to time in *The Journal of Agriculture*, the general success of the plant as a forage crop seems to warrant a publication of replies to the above questions.

1. Time for Sowing. From now on until the first of August, and in localities favoured with rain even later. Our seedings made in August last year were a complete failure. Successful seedings might have been made a month ago. If the plants are not allowed to blossom, that is, if kept back by pasturing, they should live twelve months, and furnish three or four feedings.

2. Seed per Acre.- Three pounds if sown with grain drill, and four to five if sown broadcast If sown broadcast a light harrowing is sufficient to cover the seed.

3. Will English Super do as a Fertiliser? Any good soluble phosphate will do and will pay, if on the same land phosphates are required for the wheat crop. A hundredweight per acre would be a fair application, while even less might be sufficient. If a phosphate is to be applied it is a good plan to mix the seed with the phosphate and sow the whole with the fertiliser drill. Our experience with kale sown in drills 16 inches apart suggests the same plan for rape. Although in drills 8 inches apart it provides paths between the rows sufficiently wide for sheep to follow in grazing. It is a common thing where rape will grow luxuriantly to sow it in drills up to 3 ft. apart, and cultivate between the rows. If it is difficult to gauge the drill to sow as low as 3 lb. per acre, by mixing with the phosphate the quantity of seed may be reduced as desired.

4. Depth to Sow. Rape might suffer if sown deep. It is a small seed, and naturally requires but little covering; ½ to 1 in. is the right depth.

5. Should it be Sown Wet or Dry? -The same rules that govern seeding to grains will apply with rape. It will remain a long time in dry soil and germinate perfectly when rain comes.

We have sown upwards of 20 acres on the College Farm within the past three weeks, and will make other seedings at intervals of five or six weeks.

PICKLING WITH FORMALIN FOR PREVENTION OF FUNGOUS DISEASES OF CEREALS.

By W. L. SUMMERS, INSPECTOR OF FERTILISERS.

South Australian farmers have to contend against the ravages of several diseases which attack their cereal crops. The principal of these are red rust, "black rust," bunt, smut, and wheatstem-killer or takeall. The experience of the past few years has demonstrated beyond a shadow of doubt that as far as red rust is concerned the farmer can protect himself against any serious loss by the cultivation of varieties of wheat which have proved resistant to rust; but, so far, none of the other diseases referred to have been successfully combatted by the development of varieties not liable to attack. Bunt, or smut, as it is usually called, has for many years been dealt with by means of various solutions in which the seed is treated before being sown. The control of the disease known here as black rust has, however, always been regarded as unamenable to such treatment, but quite recently Mr. D. McAlpine, Vegetable Pathologist to the Victorian Department of Agriculture, has stated that this disease is really "leaf smut," and has recommended the use of formalin pickle. Practically no experiments have been undertaken in Australia in the pickling of the seed to prevent damage by the wheatstem fungus or takeall, but we believe this work will be taken in hand by Mr. McAlpine during the coming season.

In view of the enquiries received concerning the use of formalin as a preventive of bunt, smut, and so-called black rust, the following report by Mr. McAlpine, republished from the *Agricultural Journal* of Victoria, will be of interest to those farmers who intend using formalin this year

Bunt *(Tilletia)*, or stinking smut as it is usually called, is easily recognised, both from the appearance of the grain and the ear The grain is filled with a black mass of fungus spores which emit an odour not unlike stinking fish, especially when rubbed, and the skin is of a dark, unhealthy, green colour. The ears affected remain longer green than healthy ears, and being lighter than the sound ones, do not bend over, but remain upright.

Smut *(Ustilago)* is also characterised by the grain being filled with a mass of black, dusty spores, which are very conspicuous, and usually the loose spores are scattered by the wind. In barley, however, there is the naked and covered smut, and it was the latter variety dealt with in these experiments.

In order to understand the treatment, it is necessary to know that infection can only take place when the plant is young and tender, and the fungus filaments grow inside, keeping pace with the growing plant, until the young seeds are formed, and then the fungus uses all the nourishment stored up there for the production of its reproductive bodies or spores. These spores are so light and so numerous that in harvesting operations they readily become attached to the healthy grain, and if the conditions are favourable infect the young plant when germination occurs. It is evident that prevention must be resorted to, and the seed to be sown is treated in order to destroy or prevent the germination of the spores. The most commonly used steep or pickle is that of bluestone or sulphate of copper, but corrosive sublimate and formalin have also been found efficacious.

BUNT OR STINKING SMUT OF WHEAT.

In order to test the relative merits of bluestone and formalin for the stinking smut of wheat, experiments were carried out at Port Fairy with both. Seed wheat was thoroughly infected with the spores of stinking smut, and divided into three portions, one being treated with bluestone solution, another with formalin, and a third left untreated. Large patches were sown in each case, and carefully examined by Mr. Goldie and myself towards the end of December.

Bluestone was used at the rate of 1 lb. in five gallons of water, and formalin at the rate of 1 lb. in 40 gallons of water.

The method adopted was to spread out the seed on a wooden floor and sprinkle the solution over it, turning the grain over and over, either by shovelling or raking, so that all the grains became thoroughly wetted. The seed was then spread out to dry, and it was found that it left in a thin layer over night it was ready for sowing in the morning. Instead of sprinkling, dipping may be resorted to. A bushel or so of seed is placed in a bag and dipped in the solution, taking care that all the grains are thoroughly wetted by shaking the bag and plunging it in and out. In the case of bluestone only a minute or two is necessary for the dipping process, on account of its corrosive action, but in the case of formalin five minutes were allowed. In transferring treated seed from one bag to another care has to be taken that the bags so used are either absolutely new or have been dipped in the solution to destroy any smut in them.

The result of the treatment was very conclusive. While the untreated plot contained at least 50 per cent. of smut, careful search over the treated plots failed to reveal a single smutty head. Thus both solutions were equally successful in destroying the smut, but it was noticeable that the plot treated with formalin looked much better, and was a little further advanced. Mr. Goldie also informed me that from the very start the formalin plot had a healthier appearance.

Barley Smut.

The same treatment was carried out with barley, but on a much larger scale. Chevalier barley, sown in the beginning of July, was treated with formalin, 1 ℔. in 40 gallons, and a portion left untreated. It was reaped on December 21, and, while on the 20 acres treated not a single smutty ear could be seen, in the untreated portion there was not a single stook in which several smutty ears could not be detected. Mr. Goldie is naturally very pleased with the simplicity and efficacy of the formalin treatment, and will use nothing else in future.

Relative Merits of Formalin and Bluestone.

In comparing the two solutions of formalin and bluestone it must be remembered that formalin is volatile and non-corrosive, while bluestone is very corrosive, but the latter solution may be used again and again without becoming exhausted. It follows, therefore, that only the amount of formalin should be prepared that will be required for immediate use, and sprinkling should be preferred to dipping. The original formalin solution should be kept securely corked. The cost will be practically the same, and the formalin is less injurious to the grain than bluestone. The corrosive action of the bluestone can be lessened by dusting powdered lime over the grain immediately after treatment, but this prevents sowing with the drill. The destruction of a certain proportion of the grain is not an unmixed evil, because it will act most injuriously on those already somewhat damaged, and consequently most likely to produce a weakened plant.

Schering's formalin should be asked for when purchasing. This can be obtained at about 2s. 10d. per ℔. in Adelaide, in original one-pound bottles. Formalin being a colourless liquid and poisonous must be kept where there is no chance of children or others obtaining it in ignorance of its nature.

"JOURNAL OF AGRICULTURE."

From January 1, 1904, the "Journal of Agriculture" will be posted to anyone resident in South Australia bona fide engaged in the cultivation of the soil on payment of a REGISTRATION FEE of One Shilling per annum. Single copies will be supplied at 3d. each; back issues at 2s. 6d. per doz. The indexes of Vols. I. to VI. can be obtained by members of the Agricultural Bureau and subscribers desirous of binding their volumes.

ANALYSES OF FERTILISERS.

By W. L. Summers, Inspector of Fertilisers.

The following results of analyses of samples of fertilisers obtained by myself during the past four months are published for general information In each case the certificate of constituents, or guarantee registered by the vendor, is shown in brackets, thus (36 per cent.), immediately before the results of the analyses. As additional samples are obtained and tested the results will appear in *The Journal*:—

Australasian Implement Company's Shirley Superphosphate (three samples).—Water-soluble phosphate (36 per cent.), 36 per cent., 34.3 per cent., 35.4 per cent., 36.7 per cent.

Elder, Smith & Co's Ceres Superphosphate.—Water-soluble phosphate (36 per cent.), 38.1 per cent., 38.7 per cent., 39.3 per cent.

Elder, Smith & Co.'s Lawes' Superphosphate.—Water-soluble phosphate (36 per cent.), 39 per cent., 39.6 per cent., 37.3 per cent., 37.3 per cent., 39 4 per cent.

Norman & Co.'s Superphosphate.—Water-soluble phosphate (35 per cent.), 36.6 per cent., 37.2 per cent., 38.7 per cent.

Norman & Co.'s Reliance Superphosphate.—Water-soluble phosphate (32 per cent.), 35 1 per cent.

George Wills & Co.'s United Alkali Company's Superphosphate.—Water-soluble phosphate (36 per cent.), 37.4 per cent., 38.4 per cent

Adelaide Chemical Works Co.'s Mineral Superphosphate.—Water-soluble phosphate (36 per cent.), 39.3 per cent., 41 9 per cent , 38.5 per cent.

Wallaroo Phosphate Co.'s Superphosphate.—Water-soluble phosphate (36 per cent.), 39.3 per cent., 41.2 per cent

Clutterbuck Brothers' United Alkali Co.'s Superphosphate (Planet Brand).—Water-soluble phosphate (36 per cent.) 37.6 per cent.

Clutterbuck Brothers' Special Superphosphate.—Water-soluble phosphate (37 per cent.), 38.7 per cent.

D. & J. Fowler & Co., Limited, Lion Brand Superphosphate.—Water-soluble phosphate (36 per cent.), 44.3 per cent., 43.3 per cent.

D. & J. Fowler & Co., Limited, Lion Brand Superphosphate.—Water-soluble phosphate (39 per cent.), 45.4 per cent., 14.3 per cent.

Adelaide Chemical Works Co.'s Bone Superphosphate.—Nitrogen (2.1 per cent.), 1.8 per cent.; water-soluble phosphate (15.2 per cent.), 22.8 per cent.; citrate-soluble phosphate (15 8 per cent.), 12.2 per cent.; acid-soluble phosphate (6.8 per cent.), 4.3 per cent.

Adelaide Chemical Works Co.'s Guano Superphosphate.—Water-soluble phosphate (25 per cent.), 33 8 per cent., 33.7 per cent , 35.2 per cent., 34.4 per cent.; citrate-soluble phosphate (5 per cent.), 2.4 per cent., 3.7 per cent., 1.7 per cent., 1.5 per cent.; acid-soluble phosphate (3 per cent.), not tested

Adelaide Chemical Works Co.'s Bonedust.—Nitrogen (3.5 per cent.), 3.7 per cent.; acid-soluble phosphate (45 per cent.), 43.4 per cent.

Crompion & Son's Bonedust.—Nitrogen (3.9 per cent.), 3.9 per cent.; acid-soluble phosphate (44.67 per cent.), 45.2 per cent.

Adelaide Chemical Works Co.'s S.A. Super.—Water-soluble phosphate (30 per cent.), 34 6 per cent., 35.6 per cent., 33.8 per cent.; citrate-soluble phosphate (2 per cent), 1.6 per cent., 1 4 per cent., 3.9 per cent.. acid-soluble phosphate (3 per cent.), not tested.

Adelaide Chemical Works Co.'s Wheat Manure.—Nitrogen (1.05 per cent.), 0.95 per cent.; water-soluble phosphate (28.1 per cent.), 28.8 per cent.; citrate-soluble phosphate (5.9 per cent.), 6.5 per cent.; acid-soluble phosphate (6 per cent.), not tested.

Adelaide Chemical Works Co.'s Hay Manure.—Nitrogen (1 per cent.), 0.65 per cent.; water-soluble phosphate (30 per cent.), 31.1 per cent.; citrate-soluble phosphate (2 per cent.), 4.9 per cent.; acid-soluble phosphate (3 per cent.), not tested.

Adelaide Chemical Works Co.'s Super B.—Water-soluble phosphate (15 per cent.), 36.7 per cent., citrate-soluble phosphate (15 per cent.), 3.7 per cent.; acid-soluble phosphate (5 per cent.), not tested

POTASH FOR WHEAT CROPS.

By W. L. Summers, Inspector of Fertilisers.

Experiments have been undertaken by the Department of Agriculture at Roseworthy College Farm and elsewhere for a good many years, with small dressings of potash, in addition to phosphates, but very rarely indeed has the use of potash resulted in financial benefit. Last year we arranged to have a few tests made with heavier dressings to see whether we could appreciably increase the yield by adding potash. These were undertaken by Messrs. J. C. Ruwoldt, of Mount Gambier, and A. L. McEwin, of near Brinkworth. Unfortunately, owing to rust Mr. Ruwoldt's plots were affected to such an extent as to make the results valueless, but a very fair test was secured on Mr. McEwin's farm. The land selected by Mr. McEwin had been under cultivation for fifteen years, and prior to last year had carried five crops of wheat. In 1901 it was cropped with wheat and manured with phosphates for the first time. It was fallowed the following season, and again cropped last year. The land is on a gentle slope, and consists partly of red, sandy loam, over clay, and partly of black loam, over limestone. The plots were laid out to include as nearly as possible an equal area of each class of soil. In each case the potash was drilled into the soil about a week before the seed was sown. On April 24 60 lb. per acre of King's Early wheat was sown on the plots, which were each two acres in area. The following table shows the returns from each plot -

No. of Plot.	Manured with (per Acre).	Yield per Acre.		Cost of Manure per Acre.	
		bush.	lbs.	s.	d
1	100 lbs. Mineral Super and 70 lbs. Muriate of Potash ...	17	21½	12	3
2	70 lbs. Muriate of Potash ..	12	4	8	6
3	100 lbs. Mineral Super and 84 lbs. Sulphate of Potash .	19	28½	14	7
4	84 lbs. Sulphate of Potash . .	14	15	10	10
5 (20 acres)	100 lbs. Mineral Super . .	20	0	3	9

At the invitation of Mr. McEwin I inspected these plots in October. Then there was little difference in the appearance of plots 1, 3, and 5, but plots 2 and 4 were very backward, and did not promise more than 8 to 10 bushels per acre. These two plots were at that date only just coming into head, whereas the other plots were fully a fortnight earlier. The potash plots were no better in appearance than the unmanured strips between them. As the season developed the backward plots benefited from the unusually moist, cool weather during the latter part of October and November, whereas the more forward plots suffered slightly from frost and also hot winds when they were just in ear. The grain of the potash plots was also slightly heavier than the other, but the vagaries of the season would probably account for this.

As will be seen from the figures given above, the sulphate of potash has been more beneficial or, perhaps, when compared with the phosphate plots, we would be justified in saying it was less harmful than the muriate. Comparing the yields from plots 1, 3, and 5, it will be seen that the plot receiving sulphate of potash in addition to the phosphate shows a yield short by 31½ lb. per acre of the yield of the phosphate only plot (No. 5). When allowance is made for the variation in soil, which it is impossible to avoid altogether, these returns may be accepted as practically the same. Plot 1, however, shows that the muriate had a distinctly injurious effect, the application resulting in an actual deficiency of over 2½ bushels per acre. The same thing is illustrated in plots 2 and 4, the muriate giving a return of 2 bushels 11 lb. less than the sulphate. Possibly some exception will be taken to the relatively heavy dressing of potash. However, as numerous experiments with manures containing a small percentage of potash showed practically no benefit, our object was to test whether we could increase the returns to any appreciable extent by the use of ½ cwt. of sulphate and an equivalent amount of muriate of potash. Of course, no definite conclusions can be drawn from a single experiment like this, but we have the results of previous experiments to go on, as well as the fact that analyses prove our average northern wheat lands to be relatively rich in potash. There is, therefore, no evidence at present to cast any doubt on Professor Lowrie's statement that under the present method of cropping the soil only once in three years it would probably take generations to impoverish the potash in our average wheat lands.

In this connection I would refer to two experiments carried out at Roseworthy Farm this year. On page 405 of the February *Journal* it will be seen that plot 3, manured with 2 cwt. per acre of a fertiliser containing 4 per cent. nitrogen, 15 per cent. potash, and 18 per cent. water-soluble phosphate, yielded 18 bushels 36 lb. per acre; while plot 3, on page 403, shows a yield of 18 bushels 41 lb. Both plots received the same amount of phosphate, but the former received 10 lb. nitrogen and 33 lb. pure potash per acre in addition. These plots were laid out on land which, to use Professor Towar's words, "had probably been manured with phosphates as much as any farming land in the State." On page 450 of the March issue Professor Towar reports on another series of tests. On plot 5 the application of muriate of potash gave a return better by 2 bushels than plot 6, which had no manure. On plot 9, when added to mineral super, it yielded 12 lb. less than plot 4, receiving super alone. On plots 10 and 11, when added to nitrate of soda and sulphate of ammonia respectively, the yield was not influenced; while on plot 13, when used in addition to the nitrate and super, it increased the yield over plot 7, where these two manures were applied without the potash, by 36 lb. per acre.

In the New South Wales *Agricultural Gazette* for March we find reports on experiments carried on at Wagga for four years. In 1902, however, owing to the drought, the crops were not harvested. The following table gives the results of these tests:—

—	1900.	1901.	1903.
	bushels per acre	bushels per acre	bushels per acre
No Manure Plot	7⅔	17⅔	20⅔
200 lbs. Super only	13⅓	22⅔	33
200 lbs. Super, 60 lbs. Sulphate of Ammonia, and 30 lbs. Sulphate of Potash ...	10	20⅓	32⅓

The same land was used each year, and, as will be seen, in each case the super by itself gives a better return than the complete fertiliser.

We are now endeavouring to arrange with several members of the Agricultural Bureau to set aside a block of about 5 acres for experimental work, in order to test the effect of continuous application of phosphates and potash combined and each by itself. It is only by such means that we will learn definitely whether we need to go to the expense of applying potash to land that has been frequently dressed with phosphates.

DEPARTMENTAL NOTES AND WORK.

During March Mr. Quinn has visited orchards at Belair, and attended the Conference of Southern Agricultural Bureaus at Strathalbyn, and gave an address on the present prospects of the fruit industry. Much of his time has been occupied in the inspection of fruit which is accepted for export by the buyer from the packer only on condition that it receives the Inspector's approval.

During the month of March Mr. Summers attended the Conference of Branches at Strathalbyn, and Bureau Show at Cherry Gardens. In company with members of the Council of Agriculture he also visited the typical orchard at Mylor, besides which he has taken various samples of fertilisers for analyses. He notes an active demand this year for fertilisers, and, as stocks on hand are not very large, would strongly urge farmers who have not already done so to order their requirements at once.

Export and Import of Fruits and Plants.—During March the Inspectors under the Vine, Fruit, and Vegetable Protection Act certified for interstate export to Victoria, New South Wales, and Queensland 13,594 cases of fruits, 9 packages of plants, and 2,647 crates and bags of vegetables. Of these the bulk went to Broken Hill, but 4,224 and 1,684 cases of grapes went under the departmental stamp to Sydney and Brisbane respectively. During this time 2,883 cases of fruit (chiefly apples) were certified as suitable for export to Europe, at the request of the exporters. The imports during March consisted of 1,280 cases of fruits (tropical) and 49 packages of plants Eleven parcels of plants were detained or destroyed, and 78 cases of fruits were destroyed, owing to the requirements of the law dealing with diseases in vegetation not being complied with by the importers.

Roseworthy College examinations were concluded on February 22, and the following students won their diplomas:—1. Archie Scott Martin, of Knoxville; 2, Lloyd M. Hodge, of Kapunda; 3, Ernest S. Alcock, of Unley Park; 4, Fred. S. Faulkner, of Stansbury; Frank P. Nicholas, of Lyndoch; Leonard C. Dobbie, of College Park; 5, Alexander J. Inglis, Booborowie Forty-one students were in attendance up to the close of the examinations. The next session of the College will commence on April 20.

The Minister of Agriculture (Hon. R. Butler) has approved of the awarding of scholarships for the Roseworthy Agricultural College:- District I., William Rowland Fairweather. None of the candidates competing in other districts qualified for scholarships. The Minister has therefore decided that the vacant scholarships shall be awarded respectively to W. T. McLean, E. Leishman, W. Motteram, R. Baker, and W. L. R. Donnell, all of whom competed in District I. and secured the necessary percentage for scholarships. All the successful candidates were prepared at the School of Mines Preparatory School.

Mr. F. L. Faulkner, late farm foreman, severed his connection with the Roseworthy College Farm, and leaves at an early date to take up his duties in Western Australia. Applications were invited in the daily papers from persons competent to fill the position, and Mr. E. R. Emery, who holds the College diploma, has received the appointment.

FARM AND DAIRY PRODUCE MARKETS REVIEW.

Messrs. A. W. Sandford & Co. report on April 1, 1904:—

There was a marked contrast between the weather experienced during March and that of its immediate predecessors, which were so cold and wet that vignerons actually feared at one time that the grape crops would suffer, through delayed ripening; but as the temperature throughout March was warm, the fruit matured splendidly. There has been very little rain recorded—indeed, the month was one of the driest we have had for some time; but as the North still reports excellent supplies of both feed and water, farmers and grasiers are well satisfied with the promising outlook for the winter.

Business at no time assumed anything approaching briskness, most traders putting through only very meagre sales. This has been all the more disappointing, as it was reckoned that the moneys from the harvest would long ere this be well in circulation; but many farmers still tenaciously hold on to their wheat in hopes of even higher prices being secured. On the other hand, commercially things are very sound. At Broken Hill the developments in the mines are said to be most assuring. Metals are quoted firm, Copper and Lead having advanced, whilst Silver is quite equal to last quotation.

The weakness in Breadstuffs in the European Market mentioned formerly continued until c.i.f. cargoes were quoted at 30s. Within the last day or two, however, a slight reaction took place, and sales were made up to 30s. 7½d., but no great activity was evinced. The Wheat Markets in the various States have conformed to the variations in Europe, and prices receded to 3s. f.o.b., at which considerable purchases were made by shippers. In South Australia the wheat fleet has been either loaded or provided for, all recent charters having an option of loading ports have been sent on. Deliveries of wheat from farmers have been exceedingly small, and unless something unforeseen should occur it is possible that our farmers, who are certainly the principal holders, will find that they have held too long. Flour has had a very dragging business throughout the month. There has been little or no enquiry for export, and local trade has been small. Offal has declined; there are re-sellers in the market, and as far as this State is concerned there appears little chance of a recovery. In New South Wales, where bran has been quoted as low as 5½d. per bushel, the market is firmer at about 6½d. In Fodder lines there is no alteration to report, forage dealers finding only very limited enquiry for Chaff locally with scarcely any export trade.

Potatoes.—It is many years since values in this line kept so persistently low, and at present the trend is towards even cheaper rates, the cause being the exceptionally favourable season for the growth of the tuber. Local grown are still holding the Adelaide market, and likely to continue for at least several weeks: result, Gambier growers are becoming anxious, especially as they are finding the export trade to Western Australia only very limited. Onions.—The firming tone reported in our last has not been sustained, as the acreage under crop turned out heavier than at first expected.

In Dairy Produce quite an unusual feature characterised the supplies forwarded, but during March it is expected that abrupt shortages will set in; but the fine, even weather that prevailed, coupled with the splendid feed in most districts, checked any shrinkage that might have occurred. Certainly top grades of Butter show an advance. This is the result of the heavier demand, buyers at the time going in more for quality; but as a few parcels from Victoria have already reached here, any hardening on present rates is precluded, as that State has a substantial exportable surplus. Supplies of fresh Eggs have kept up remarkably well, although the east has not operated to any great extent, but strong western buying orders and a good local demand caused values to steadily harden, so that the line shows a rise of 2½d. per dozen; therefore, unless cold weather sets in, it is not reckoned that any further immediate advance will take place. Cheese. As present quotations are about the lowest on record, it is considered bedrock has at last been touched. At all events the cheapness of the article has very much stimulated the consumption, and heavy sales have been put through, but we fear there is no prospect of a rise in price whilst such quantities are held throughout the Commonwealth. Bacon.—The pleasing feature in this line is the steady growing export demand for the South Australian cured article, and as stocks are light for time of year the trend in values is upwards. Hams are also meeting with better enquiry, several parcels having been sold for shipment. Almonds are finding ready buyers, but values are stationary. The Honey market is in about the same condition as when writing last, the difficulty this season being to secure prime samples.

In Live Poultry there has been a decided improvement in the condition of most of the birds penned, resulting in a corresponding advance in prices realised, but during last few days of the month heavy quantities came forward intended for holiday trade, but most buyers had ere then secured their requirements, so that values had to again give way, but a recovery is likely to be effected once Easter is past.

MARKET QUOTATIONS OF THE DAY.

WHEAT At Port Adelaide, shipping parcels, new, 3/- to 3/1 per bushel 60 ℔.

FLOUR City brands, £7 15/, country, £7.

BRAN. 6¾d POLLARD. 8d. per bushel of 20 ℔.

OATS Local Algerian and Dun, 1/5½ to 1/7, White Champions, 1/8 to 1/10 per bushel 40 ℔.

BARLEY.—Malting, 2/10; Cape, 1/8 up to 1/10 per bushel 50 ℔.

CHAFF.—£2 10/- to £2 12/6 per ton of 2,240 ℔., bags in, f.o.b. Port Adelaide.

POTATOES.—New locals, £2; Gambiers, £2 10/- per 2,240 ℔., f.o.b. Port Adelaide.

ONIONS. New locals, £2 10/- per 2,240 ℔., Gambiers, £3

BUTTER Creamery and factory prints 10d. to 11½d., choice separator and best dairy, 9d. to 10½d., fair dairy and medium separator, 8d. to 9d., store lines, 7d. to 8d.

CHEESE.—Factory make, 4d. to 5½d. per ℔.

BACON Factory cured sides, 7¼d. to 7¾d., farm flitches, 5½d. to 6½d. per ℔.

HAMS. S.A. factory, 9d. to 10d. per ℔.

EGGS. Loose, 1/1½, in casks, f.o.b. 1/3 per dozen.

LARD. In bladders, 5½d., tins, 4½d. to 5d. per ℔.

HONEY. 2¾d. for prime clear extracted, in 60-℔. tins, Beeswax, 1/1½.

ALMONDS.—Softshells, 4d. to 4½d., kernels, 9d. per ℔.

In Live Poultry heavy-weight table roosters realised 1/7 to 2/ each; good plump hens and fair-conditioned cockerels, 1/ to 1/6; poor and light, 8d. to 10d.; ducks, 1/3 to 2/ for fair to good; geese, 2/ to 2/9, pigeons, 5d. to 5½d.; turkeys, 4d. to 5½d. per ℔. live weight, for fair to medium table birds.

Above quotations, unless when otherwise specified, are duty paid values on imported lines. Grain, Flour, and Forage for export are f.o.b. prices at Port Adelaide. Dairy products are City Auction Mart rates. In Grain, Chaff, and Potatoes sacks are included, but weighed as produce. Packages free with bulk Butter and Cheese.

DATES OF MEETINGS OF BRANCHES OF THE AGRICULTURAL BUREAU.

With a view of publishing in the "Journal" the dates of meetings of the branches of the Agricultural Bureau, Hon Secretaries are requested to forward dates of their next meetings in time for publication

Branch	Date of Meeting		Branch	Date of Meeting	
Balaklava	April 9	May —	Minlaton	April 23	May 21
Booleroo Centre	26	24	Morphett Vale	19	—
Bowhill	2	7	Mount Bryan East	2 & 31	28
Brinkworth	1	6	Mount Compass	9	—
Burra	15	21	Mount Remarkable	28	26
Carrieton	26	24	Nantawarra	27	25
Cherry Gardens	12	10	Naracoorte	9	14
Clare	29	27	Norton's Summit	29	27
Clarendon	11	—	Onetree Hill	28	26
Colton	2	7	Penola	9	14
Elbow Hill	26	24	Pine Forest	26	24
Eudunda	25	23	Port Broughton	28	26
Finniss	4	2	Port Elliot	16	21
Forest Range	28	26	Port Lincoln	15	20
Gawler River	29	27	Port Pirie	23	—
Gladstone	2	—	Pyap	6	4
Golden Grove	28	26	Reeves Plains	4	27
Hartley	—	27	Richman's Creek	25	30
Inkerman	26	24	Riverton	30	28
Johnsburg	30	—	Saddleworth	15	20
Kanmantoo	29	27	Stansbury	2	7
Kapunda	2	7	Strathalbyn	19	17
Kingscote	11	9	Utera Plains	30	28
Kingston	2	7	Virginia	25	23
Koolunga	28	26	Wandearah	28	23
Longwood	30	—	Watervale	25	23
Lucindale	23	—	Whyte-Yarcowie	16	21
Maitland	2	7	Willunga	2	7
Mallala	4	2	Wilmington	27	25
Mannum	16	21			

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AGRICULTURAL·BUREAU CONFERENCES.

NORTHERN BRANCHES.

The twelfth Annual Conference of Northern Branches of the Agricultural Bureau was held at Gladstone on Wednesday, February 10

Present Gladstone Branch Messrs Gallasch Brayley, Cook McDonald, Tunbridge, Smith Sargent, Goode and Wornum Caltowie Branch Messrs Hewitt, Petatz and Lehmann Port Pirie Branch—Messrs Wilson, Hector, and Crispin Crystal Brook Branch—Mr Pavy Appila-Yarrowie Branch- Messrs Klem and Lawson Messrs R Caldwell A Molineux, and J Miller from the Council of Agriculture and Messrs W L Summers and George Quinn, representing the Department of Agriculture also attended

A fine collection of fruits was tabled by Messrs W Brayley, J G Lehmann, and W A Wornum

Mr J Gallasch, of Gladstone Branch, occupied the chair, and in his opening address expressed regret at the very poor attendance It would seem that members of the Bureau at present were absolutely indifferent to the work in hand That was not so in the past but as the older members fell out the younger people were not taking their share of their duties There was a great future before South Australia but there would be little or no progress if the younger generation of farmers think they can take it easy Progress must be their watchword He greatly regretted that they were losing the services of Mr G S Thomson their Dairy Instructor Mr Thomson's work was greatly appreciated throughout South Australia and he believed he voiced the opinions of most in thinking the Government had made a great mistake in allowing Mr Thomson to leave South Australia for the sake of £25 per annum

RUST-RESISTING WHEATS.

Mr J Miller (Council of Agriculture) gave a short address on this subject In view of the severe losses experienced throughout the State through rust he strongly recommended farmers to grow rust-resisting wheats There were quite a number of wheats proved to be rust-escaping or rust-resisting Amongst these he could speak personally of Marshall's No 3 and Phillis Marvel for early sowing on clean land and Gluyas and Carmichael Eclipse quick maturing wheats to be sown later in the season In the later districts with better rainfall he thought Majestic wheat could not be improved on These were all good yielders rust-resisting and good milling wheats besides good for hay Mr Molineux spoke shortly of the life history of rust and its method of development He strongly urged farmers to grow rust-resisting wheats There were such wheats equally as good both in yield and quality, as the best of the soft wheats they usually grew Mr Brayley stated that after dearly bought experience he could endorse the recommendations of the previous speakers This year Marshall's No 3 and Silver King yielded with him fully three times as much as the soft wheats With the latter the sample was much under the standard while the former gave a prime sampl He found Gluvas about the most rust-resisting wheat he had seen

BEST WHEAT FOR HAY

Mr W A. Wornum read a paper on this subject written by Mr J Rundle He had grown a number of different wheats for hay during the past fourteen years Of these he found the best to be Purple Straw Red Straw, Rattling Jack, White Tuscan Marshall's No 3, and Gallant These make first-class hay, stool well, have a good flag and hold together well in the sheaf They also will allow the grower to let the grain get on well towards maturity while still retaining a good colour With some of the white straw wheat grain could only be obtained at the loss of colour or greenness at the expense of grain In the later districts White Tuscan was probably the best hay wheat but here it usually comes in too late and suffers from the blighting effects of hot winds Where the land is dirty he advised sowing the early-maturing varieties, such as Early Para, Gluyas Neumann's Early, or Smart's Early, as they come along quickly, and are fit to cut for hay with the wild or black oats He did not believe in bearded wheats for hay King's Early was one of the heaviest yielding hay wheats but, being stiff in the straw, was difficult to bind well If he were sure when sowing what portion of the crop he would cut for hay, he would sow the wheat a little thicker and give more manure. He found that on the headlands which were cross-drilled he cut immense crops of hay. Mr. Catt asked why oaten hay was not grown more largely in the North. We could not get a market outside Australia for wheaten hay, while we saw orders for thousands of tons of oaten hay pass by because we could not supply it. Several members stated that they could grow as heavy, if not heavier, crops of oaten hay as wheaten, but the market was irregular, depending upon extreme circumstances. Mr. Summers stated that he thought Mr. Rundle had answered this question. Generally speaking, the northern farmer sowed for grain, and cut for hay according to circumstances governing things at haymaking time. Mr. Caldwell thought, while oats could be grown to a large extent in South Australia, the markets were very uncertain for oaten hay. Mr. Gallasch did not know what was done elsewhere, but at Gladstone the local mill would pay 2s. 6d. to 5s. per ton more for good oaten hay than wheaten hay.

NOXIOUS WEEDS.

In the absence of Mr. Hector, the writer, Mr. Wilson read a paper on this subject. All weeds were more or less noxious, according to their number, habit of growth, and the land they occupied. Even wheat amongst barley or barley amongst wheat was noxious. It was to the interest of the grower to destroy all weeds, whether declared noxious or not, as they only rob the crop and make it "dirty." This being the case, it was to be presumed that the Noxious Weeds Act was specially intended for the benefit of the owner of grazing land. Stock require a variety of herbage to thrive on, and it was therefore the aim of the grazier to utilise the vegetation on his pastures to best advantage, and to prevent the spread of objectionable plants, which would choke out the more useful herbage. It was this that induced Parliament to pass the Thistle Act of 1862 and later legislation, which, however, had been a failure. Landowners had been compelled to destroy certain weeds at considerable expense year after year without any real good being accomplished, besides which several of these plants had since been proved valuable, and were eaten by stock. The Scotch and the variegated thistle (which had been struck off the list), the Bathurst burr, and star thistle were all useful at certain seasons for stock, and during the drought some of them had proved very valuable. Of all the weeds under the ban of the law the star thistle of the North was the most difficult to get rid of, and although it had been proved of undoubted value for stock, they were compelled by the law to spend money year after year in futile attempts to keep it under, while it is left to seed on roads, watercourses, and Government reserves. He considered that the owner of the land knew better what he ought to do with it than did Parliament, and if it suited him to allow his paddocks to become covered with star thistles or any other plant for the benefit of his stock he did not see why any one should have the right to interfere with him. Considerable discussion took place on the paper. Mr. Molineux strongly condemned Mr. Hector's contention that he could do what he liked on his own land. In every direction they were compelled to legislate to prevent people allowing things to become a source of danger or a nuisance to his neighbours. If Mr. Hector could prevent the seeds spreading on to other land he might with some reason ask to be permitted to grow star thistle for his stock. Mr. Caldwell supported Mr. Hector. Legislation on matters of this sort was a farce, and they should leave it to nature to work its own cure. All those weeds soon wore themselves out if left alone. Hon. Alfred Catt thought the whole question depended upon being sure first of all that the plant was valueless before declaring it a noxious weed. Mistakes had been made in the past, but it was not always possible to avoid them. He agreed with Mr. Molineux that no man had a right to grow weeds to the detriment of his neighbours. Mr. Summers could not understand why it was only "weeds" that would die out if left alone; why should not useful herbage suffer the same fate? He instanced several weeds which had been flourishing in Mr. Caldwell's district for many years which showed no indication of dying out. Mr. Quinn thought too much was made of this point. Why should a weed that grows and dies, and returns to the soil all it removed, impoverish the land? True, they would notice that after a few years the plants might become less vigorous, but this was probably due to overcrowding. In reply, Mr. Hector considered it a ridiculous farce to attempt to compel landowners to destroy weeds that were so widespread as the star thistle. In many cases it would cost more than the land was worth to carry out the law. He still held that no one had any right to prevent his growing such plants on his land.

TRAINING THE PEACH.

At the afternoon session, Mr. George Quinn (Horticultural Instructor) gave a very interesting address on the training of the peach. With the assistance of sketches on the blackboard he described the manner of pruning to form a low, spreading tree with an open centre. He also illustrated the different fruiting growths, and explained how these should be pruned under varying circumstances. A number of questions concerning the reworking of old trees, the treatment for curl-leaf, etc., were answered by Mr. Quinn.

FERTILISERS FOR WHEAT CROPS.

Mr. W. L. Summers (Inspector of Fertilisers) read a paper on this subject. Experience had demonstrated that their soils were comparatively poor in phosphoric acid, and that this was the first constituent depleted by the cultivation of cereals. The splendid results obtained from the use of superphosphate had proved that the farmer could supply any deficiency in available phosphoric acid at a comparatively low cost. Most of our soils were also relatively poor in nitrogen. Even this poorness, however, might represent 1,500 lb. of nitrogen per acre in the first foot of soil. Only a very small proportion of this was at any one time in a condition available to plants, but under our system of bare fallow and surface cultivation during the spring and summer the conversion of the nitrogen into an available form went on relatively rapidly. Besides this, the climatic conditions appear very favourable to the abstraction of nitrogen from the air by soil ferments, and this would help to replace what was removed by the crops. Only in this way was it possible to account for the fact that scarcely without exception in all their experiments with nitrogen for wheat crops they failed to get a profitable result. With potash, analyses had proved their soils to be relatively rich, and their experiments in manuring wheat with potassic manures bore out the correctness of these analyses, as on most of their northern soils the potash did not give any appreciable increase in the returns while in some cases the yields were actually reduced. Speaking of the wheat lands north of Adelaide, he thought they were justified in concluding that it would be very many years before it would be necessary for them to apply either nitrogen or potash. Some discussion followed, and various questions were asked.

RUST-RESISTING WHEATS.

On the motion of Mr. Caldwell, it was unanimously resolved that in the opinion of this Conference a testimonial should be presented to Mr. R. Marshall for the valuable services he has rendered the farmers of this State in raising varieties of wheat which resist the attacks of red rust under the conditions of climate that obtain in South Australia.

CO-OPERATION.

Messrs. Caldwell and Molineux spoke on the benefits of co-operation, more particularly as applied to the dairying industry.

MANURED WHEAT FOR HAY.

The Chairman asked Mr. Summers to initiate a discussion on the value of manured versus unmanured wheat for hay. Mr. Summers thought this a question quite outside the scope of discussion. Practically all the hay grown in the Lower North and South was on land manured with phosphates. Probably the horses that were worked harder than any others were those in and about the city of Adelaide. He was safe in saying that for all these horses chaffed hay from manured land formed a large proportion of their ration, yet they had no complaints of any injury resulting from its use. As a matter of fact, stock showed their fondness for the growth on land treated wtih phosphates, and when manuring was only commencing it was usually noticed that stock would leave the stubble on the unmanured land until they had fed down that where the manure had been applied. Mr. Caldwell did not agree with Mr. Summers, as all farmers knew that stock would studiously avoid rank growths, whether green or as hay, and he had no doubt that hay from unmanured land was better than that from land treated with phosphates.

NEXT CONFERENCE.

On the motion of Mr. Goode, it was resolved that the next Conference be held at Port Pirie. In the evening the delegates and other visitors were entertained by Mr. J. F. Martin, of Gawler, and a very enjoyable time was spent.

MURRAY RIVER BRANCHES.

The annual Conference of the River Murray Branches of the Agricultural Bureau was held on Wednesday, February 24, at Mannum, when the following members were present:—Mannum Branch—Messrs. Preiss (chair), Walker, Baseby, Ramm, Faehrmann, G. and O. Lenger, Schuetze, Heidrich, R. P. and F. Scott (Hon. Sec.). Murray Bridge—Messrs. Lehmann, Schubert, and Jaensch. Bowhill—Messrs. Weyland and Noonan. Mount Gambier—Mr. J. C. Ruwoldt; and Messrs. R. Caldwell and A. Molineux (members of Council of Agriculture); George Quinn (Horticultural Instructor), George Jeffrey (Wool Instructor), and several visitors.

Mr. J. G. Preiss occupied the chair, and, in welcoming the visitors, expressed regret at the small attendance and the lack of interest displayed by so many farmers in the work of the Bureau. He knew some considered their meetings a waste of time, but he differed from them, as he found that he had derived much benefit from the Bureau. He strongly urged members of the Bureau to show more interest in the work and to endeavour to interest others as well.

BORING FOR WATER.

Mr. H. Schubert read a paper on this subject. The supply of water for their households and stock was one of the most important matters they as farmers had to deal with, and the value of a good water supply could hardly be over-estimated. It was not good management to allow stock to go half-famished for want of water, as was too often the case on the Murray Flats, when there was an endless supply beneath their feet. A spring or waterhole must necessarily have more or less waste land about it. Besides, when used for watering stock it often becomes a stagnant pool, in which the cattle will stand during the hot weather, rendering the water unfit for their use. He contended it would pay better to put down a bore and erect a windmill to work a deep bore pump, and so secure a supply of clean water at all times. In view of the results obtained already in the Hundred of Burdett with these bores, he had no hesitation in predicting that in the near future the farmers would largely rely on bore water for their requirements. The boring plant he had been using was made by Mr. Mickan, of Rhine Villa, and cost about £15. With this he had bored to a depth of nearly 130 ft., and two or three men only were required to work it. The following is a description of the strata passed through:—No. 1 well, limestone gravel to 15 ft., then sandy loam to 70 ft., then freestone to 122 ft. This bore carries a depth of 22 ft. of water, and was put down in fifteen days. No. 2 well carries blue clay for 30 ft., then 9 ft. of sand, and 43 ft. of sandstone, the depth being 82 ft., with 14 ft. of water, and the time occupied in boring was twelve days. No. 3 bore was in blue clay for 60 ft., then 22 ft. of sandstone. This only holds 3 ft. of water and took thirteen days to bore. No. 4 bore is 75 ft. deep, 20 ft. being in limestone gravel, 30 ft. in sand, and 25 in stone and quicksand. This was put down in nineteen days, and the depth of water is 14 ft. The borehole is 4½ in. wide, with 4 in. casing. He had used 24 and 26 gauge galvanised downpiping for casing, but something more lasting was necessary. The cost was not heavy, and several of the wells appear to carry an inexhaustible supply of water. From his well he regularly watered twenty horses. He had a tank to carry a week's supply for 12 horses, and the water was pumped into this by the windmill, so that if they had a few days without sufficient wind to work the mill he had a supply of water on hand. He had bored through hard rock at the rate of 1 in. per hour. In reply to questions Mr. Schubert stated that unless quicksand was encountered he did not put in the casing until the bore was finished. When down about 80 ft., two men were necessary to work the lever. His derrick was about 20 ft. high, and the rods of the bore 16 ft. A hole was first sunk about 4 ft. deep, as it was an assistance in working the lever. If care was taken to start the bore straight no difficulty was experienced in keeping a vertical position. An interesting discussion followed the reading of the paper.

RED RUST.

Mr. A. Faehrmann read a short paper on this subject. As he had suffered considerable loss from rust, he had a very lively interest in this subject. While his experience led him to doubt the generally accepted theory of the life history of the disease, he thought they would all agree that the main thing was to find a remedy for it. As neither pickling nor tillage operations had any effect as a preventive of the disease, it was evident that the only hope was in the rust-resistant wheats. There were a number of these, and it would be necessary for the farmers to select from them the varieties which came nearest the standard of perfection, not only in resistance to rust, but in quality of grain and yield. Considerable discussion ensued. Mr. Molineux outlined the life history of red rust, controverting Mr. Faehrmann's theory on the subject. It had been proved absolutely beyond doubt that red rust was a fungus living upon the sap which was required by the plant to carry its grain to maturity. Mr. Caldwell instanced the value of the rust-resistant wheats, and referred to the splendid crops grown by Mr R. Marshall even in rusty years. He believed that the average yield last season in South Australia was reduced fully three bushels per acre by rust, or a total loss of 3,000,000 bushels, which could have been avoided by the growing of resisting varieties of wheat. One member stated that he had grown Purple Straw, King's Early, and Majestic wheat side by side. The two former yielded at the rate of 6 bushels per acre, being badly injured by rust, but Majestic gave a return of 12 bushels, although rust appeared on the plant late in the season. Some reference was made to the effect of manure on the prevalence of rust on the plant. Mr. Jaensch stated that on the unmanured strips of land he found the crop suffered much more from rust that that on the manured land. Mr. Caldwell thought this was due to the manured crop being earlier than the unmanured, and consequently further advanced when rust appeared. Mr. Ruwoldt stated that, although Dart's Imperial usually yielded well with him the rust did a lot of damage this year, and he only reaped 16 bushels per acre, as compared with 35 bushels from Marshall's No. 3. Mr. Faehrmann stated that he had grown both Majestic and Silver King wheats, but found they had a tendency to fall down. Majestic grown alongside Purple Straw was not worth reaping, while the latter yielded 10 bushels per acre. Messrs. Caldwell and Molineux thought Mr. Faehrmann had got his wheat wrongly named, as, wherever grown, Majestic had proved one of the most resistant varieties cultivated.

POULTRY.

Mr. F. W. Lehmann read a paper on "Increasing Production on the Farm," in which he strongly advocated increased attention to the poultry industry. With the development that had taken place in the export of frozen produce they had a practically unlimited market for their produce, and need not fear the exceedingly low prices for suitable poultry and eggs that they often had to put up with years ago. By the farmer giving increased attention to poultry, he did not mean that he should rapidly increase his flock and allow them to wander at will about the homestead. To succeed with poultry on a fairly large scale, their habits and requirements must be carefully studied. Protection from heat and from cold must be provided, cleanliness must be observed, fresh, clean water and good, sound food provided. The greatest obstacle on the farm was the question of green food in the summer months, as the lack of this would undoubtedly affect the success of the farmer's operations. In winter and spring green feed was easily provided by sowing several small plots of barley, which should be wire-netted, and made available in rotation to the fowls. Any farmer keeping a large number of fowls should keep them in several colonies, on different parts of the farm, to avoid the ill-effects of over-crowding.' An interesting discussion followed. The Chairman emphasised the necessity for keeping a supply of cool, fresh water for the fowls. He considered it paid better to feed what wheat he could to his fowls than to sell it all at 3s. per bushel. He keeps about 300 fowls, and considers the crossbred fowl better for general purposes than the purebred One member stated his experience was that good fowls would give a return of 5s. per bushel for the wheat fed to them. He would keep the fowls in flocks or colonies of about 100, and give them plenty of room to forage about for a portion of their food. Mr. Lehmann advised paying more attention to those breeds producing eggs during the winter months, when prices were high. If more than 100 fowls were kept, they should be divided and fed in different places. One of his neighbours paid all his household expenses out of the money received for poultry products.

CO-OPERATION IN DAIRYING.

Messrs. Caldwell and Molineux both addressed the meeting on the benefits of co-operation as applied to the dairy industry.

Evening Session.

Mr. G. Quinn (Horticultural Instructor) gave a short address upon "Sorts of Fruit to Grow in the Neighbourhood, and How to Plant Them." He did not advise planting on a commercial basis unless they possessed good land. The poor limestone land, with their 12-in. rainfall, was unsatisfactory. He thought in the flats formed by local creeks, where there was a good alluvial deposit, fruits of the fig, orange, lemon, peach, apricot, grape vine, olive, and almond might be grown, and if any possessed a few acres of such land where irrigation could be cheaply carried on the currant vine would pay well to grow. Almonds might pay on their cheap land, even with a 12-in. rainfall, if suitable spots were selected. Questions on pruning and planting were answered.

Mr. G. Jeffrey addressed the meeting on "Sheep and Wool." He said it was now a recognised principle for the farmer to keep enough sheep to supply his own mutton. The question of what kind of sheep he should keep could only be answered by knowing the object for which he kept them. If he desired to raise fat lambs for the Adelaide market he must cross the merino with the Shropshire or Dorset Horn. In looking to the wool products of his flock the farmer should shear the sheep as closely as possible in one cut, so that the length of the wool would be good. They should class their wool, and not put all wools into one bale. If he has crossbred and merino sheep he should keep the wools separate. Very inferior or discoloured or very yolky fleeces should be kept out, and the dirty edges of all fleeces trimmed off. The bales should be branded clearly and distinctly, and the wool should be sent down without a reserve price placed upon it The farmer cannot accurately gauge the value of the wool. In killing sheep on the farm a clean place should be selected, as this will help to keep the skins clean. These should be dried by being hung across a rail in the shade from neck to breech. The Chairman said he had no difficulty in getting rid of the lambs he raised, but, in his opinion, the ewe lambs would have to be retained if the supply was to be kept up. He had found it possible to grow two lambs in the one season, and he had actually raised four lambs from some of his ewes, but such things only occurred during good seasons. Owing to a thunderstorm he had much of his wheat knocked down, but the sheep ate up the heads, and were now picking up the grains. Mr. Jeffrey, in reply to questions, said all wool was bought on clean value, the buyer calculating how much of the total weight would be lost in scouring, and deducted that in making his values. He disagreed entirely with the Chairman's idea of keeping the ewe lambs The best practice was to buy fresh ewes, as it was better to purchase ewes from the large raisers, and, after taking lambs from them, sell them as fats. He considered there was no difference between machine- and hand-shorn wool, but he believed the machines for various other reasons would become more generally used. The improved machines did not tear the wool out, as stated.

NOTES ON FARMING.

Mr. Preiss read an interesting paper on "Notes on Farming: Past, Present, and Future." He outlined the methods adopted in the early days of the colony, and the results, including the march northwards, of the farmers as they exhausted the lands first taken up. The marked results obtained of late years from the application of phosphates had demonstrated that to the depletion of this constituent by continuous cropping the failures of former years were largely due. The question they had to face now was, will the application of phosphate alone continue for any length of time to give satisfactory results? This could only be determined by careful experiments, but it was only natural to suppose that the poorer soils will, as with phosphates, soon show the need of other plant foods, and that in time the richer soils will also reach that stage when either nitrogen or potash or both will have to be applied. Although his results from the application of phosphates had been commercially profitable, and the land apparently had permanently benefitted, as it grew more and better grass than formerly, he did not consider that the crops were the best which could be grown with the rainfall they experienced. In 1899 he sowed half of a 90-acre paddock with wheat with the drill, applying super at the rate of 120 lb. per acre, and leaving a test strip a drill width unmanured right across the block. He reaped 14 bushels per acre from the manured land, but the unmanured strip was not worth more than 4 bushels per acre. The following year he drilled oats in the stubble without any manure, but only obtained two bags per acre, the test strip of the previous year being equally poor. In 1901 the whole paddock was ploughed up and sown with wheat, 200 lb. of super per acre being applied. He reaped three bags per acre from the field, but the unmanured strip that carried poor crops in 1899 and 1900 had a much heavier crop than the rest of the field previously manured. The portion left out of crop in 1889 and 1900 also yielded better than the other portion Another experiment was started in 1900, when he ploughed up a paddock of 104 acres, of which 25 acres had been under oats the two previous years, the remainder being out of cultivation. This was sown to wheat, 120 lb. super per acre being applied to all but eight acres. The manured land previously under oats averaged 16 bushels per acre, and the balance 8 bushels, and the unmanured land 4 bushels only. The difference in yields on the manured land he attributed entirely to takeall on the land not previously under oats. In 1901 oats were sown in the stubbles, no manure being used, and the crop fed off by stock. The following year the paddock was pastured by sheep, and last year put into wheat again; 120 lb. of super per acre was drilled in, and the paddock averaged 11 bushels per acre; the crop on the headlands, and the 8-acre piece, which had no manure three years previously, would have yielded quite 4 bushels per acre more than the rest of the field. These two experiences satisfied him that they would not continue to get such good results from super alone as they got when first using it. They also showed that wheat after oats did much better than wheat after wheat, or after grazing. To make permanent homes on the land they must study how to maintain the soil fertility. Certain constituents were removed by the crop, and it was not sufficient to replace only one of them. Both nitrogen and potash were being depleted, and these must be supplied by some means or other if they were to obtain maximum crops from their land. The potash would require to be supplied by the use of potash salts, but he thought they should endeavour to replenish the nitrogen by means of farmyard manure, which should be treated in such manner as will encourage the increase of the nitrifying bacteria always present in it. The manure should then be applied in light dressings to the fallows. It had been proved that warmth, moisture, and air were necessary for the greatest development of this same bacteria in the soil, and they must therefore adopt a system of tillage which would bring about these conditions. Where they can be successfully grown, the most profitable means of increasing the nitrogen supply is the cultivation of peas, beans, clover, lupins, or other leguminous plants. Then rotation of crops must be studied. Takeall apparently could only be combated successfully by growing before wheat some crop that the fungus would not attack. He found that spelling the land did not have the desired result, as the fungus seemed to attack the grasses also, and so carried its spores through the seasons. In the discussion which followed, Mr. Molineux condemned the system of bare fallow. He believed it would pay better to grow other crops than wheat on the land. Mr. Caldwell thought the necessity for conserving the moisture in the soil did not permit of their using the fallows in the drier areas for other crops. Besides this, if they grew crops on the fallow the nitrifying bacteria would be less active, and probably render the application of nitrogenous manures necessary.

A hearty vote of thanks was accorded to those who had taken part in the Conference, which was concluded with music and refreshment provided by the local friends.

AGRICULTURAL BUREAU REPORTS.

Crystal Brook, February 27.

PRESENT—Messrs Pavy (chair), W. and A Hamlyn, Hutchison, Davidson, Weston, Townsend, Morrish, and Symons

RUST-RESISTING WHEATS —The Hon Secretary read extract from daily papers re Mr R Marshall's experiments in breeding new wheats and some discussion ensued

EARLY GREEN FEED —The Hon Secretary read paper on this subject They all recognised the necessity of having a supply of green feed for their stock, but in dry districts it is not always possible to grow summer green feed This being so it would naturally be their object to do the next best thing, and provide green feed over as long a period as possible His property was just on the border of Goyder's line of rainfall, and summer fodder without irrigation was impossible To give his stock the best chance, he had for several years made it a practice, to keep a few acres of sandy land fallowed and in readiness to sow with wheat after the first good rain in February or March In 1899 he sowed five acres about the end of February with 45 ℔ Early Para wheat and 60 ℔ super per acre A month later he was able to put his working horses every night in the paddock This was continued up to the end of July Stock were then removed and the crop allowed to grow result, 11 bushels of wheat per acre Each year since he had followed this practice, and was satisfied that it paid him well In seven years he had one total and one partial failure, two fair returns, and three very favourable Last year especially this early green feed saved a large outlay on chaff The paddock was sown on February 16, grazed as indicated for nearly five months, and a crop of 20 bushels per acre harvested

Reeves Plains, March 11.

PRESENT—Messrs Folland (chair), McCord George, Corden W and W H Day (Hon Sec) and three visitors

FENCING —Mr Walter Day initiated a discussion on this subject He favoured gum posts, cut from large trees, and would not allow them to get too dry before using them He made his fences 4 ft high, cutting a notch on the top with a crosscut saw to let in the barb wire Strainers were set seven to ten chains apart Members generally agreed with Mr Day They did not approve of wooden droppers, and would not put more than two iron posts between each gum post

Arthurton, February 25.

PRESENT—Messrs Hawke (chair), Short, Rowe, Wicks, Lamshed, Crosby, Welch, Pearson, and Palm (Hon Sec)

HOMESTEAD MEETING —This meeting was held at the residence of Mr F B Wicks, and careful inspection was made of the up-to-date implements, oil engine, chaffcutter, etc

LIGHT V HEAVY DRESSINGS OF MANURE —Discussion on this subject took place Members had used from 80 ℔ up to 160 ℔ per acre of super, and generally had not seen any benefit from the heavier dressing, except, in some cases in an increase in the straw, whereas one or two instances were given of heavier returns being obtained from the lighter dressing The Chairman considered the results would depend very largely on the character of the soil and its treatment Heavier soils would stand more manure and early fallowed land that was well worked would hold more moisture than land left rough and consequently would respond better to heavier dressings It required more moisture to get the full benefit of the heavy application He used from 90 ℔ to 150 ℔ per acre, and got good returns from the large amount

WEED —Mr Short tabled plant known locally as poison weed He was quite satisfied that it was the cause of impaction in cattle

Angaston, January 30.

Present: Messrs. Snell (chair), Radford, Friend, Smith, Rundle, and Matthews (Hon. Sec.).

Sale of Codlin Moth Apples. A resolution expressing regret at the action of the Government in permitting the sale of codlin moth infested fruit was carried unanimously. Members consider this a retrograde step and calculated to do much harm to the apple industry.

Brinkworth, February 12.

Present.—Messrs. Everett (chair), Russell, Morrison, Coombe, Cross, Heingus, McEwin, Welke, Brinkworth, and Stott (Hon. Sec.).

Pickling Wheat. Discussion took place on the use of formalin as a preventive of smut, and members wished to know whether formalin pickle would prove an effective substitute for bluestone. [Yes. The formula for formalin pickle has been published in *The Journal* several times.—Ed.]

Wepowie, February 25.

Present.—Messrs. Gray (chair), T. and J. Orrock, Gale, Smith, Chrystall, and Halliday (Hon. Sec.), and one visitor.

Harvesters. Mr. C. E. Smith read a paper on this subject. The complete harvester has forged rapidly ahead during the past few years, and there are now a good many hundreds in use in this State. The first attempts to make such a machine were not altogether successful, but most of the initial difficulties have been overcome, and the harvester of to-day occupies the premier position as a labour-saving implement. It had many advantages over the stripper; better work is accomplished with less labour and with less loss of grain. The work, too, is done better, and the wheat can be got under cover and safe from risk of damage by rain. He considered that the saving by the use of the harvester in preference to stripper and winnower was equivalent to £2 10s. per 100 bags of grain harvested. Considerable discussion ensued, but the majority of members considered that there was too much wear and tear on the machines, and that with the light average returns from the crops in this district they would not pay.

Amyton, February 25.

Present.—Messrs. Mills (chair), J. T. and W. Gum, Kelly, Ormiston, and Mullett (Hon. Sec.).

Rust-resisting Wheats.—Some discussion on this subject took place. Members stated that rust rarely did much harm in this district. It appears in most of the crops, but the grain is not injured. Last season much of the grain was pinched, but in the opinion of members rust was not responsible for much of this.

Dairying.—Mr. C. H. Tuckwell, of Wilmington, has presented to the Branch a pure-bred Jersey bull for the use of the dairy farmers in the district. A hearty vote of thanks was accorded to Mr. Tuckwell for his generous gift.

Small v. Plump Grain.—The Chairman initiated a discussion on this subject. He was greatly impressed with the results of Dr. Cobb's researches, as published in the June, 1903, *Journal*, and, while he admitted that good crops had, under favourable conditions, been grown from shrivelled seed, he thought there could be no question but that it was safest to sow plump grain. Members generally favoured plump, or at least medium-sized, grain for seed.

Longwood, February 27.

Present—Messrs. Narraway (chair), E. J. and T. G. Oinn, Nicholls, Smith, Hewer, Cheeseman, Mundy, Vogel, and Hughes (Hon. Sec.), and nine visitors.

Moisture in Manures.—Members wished to know whether moisture was allowed for in giving the analyses of bonedust. [The manure is tested just as it goes to the buyer, as this is the only fair way. If there is any loss of moisture by evaporation there will of course be less weight, but no loss of phosphoric acid.—Ed.]

Bitter Pit.—Considerable discussion took place on the question of bitter pit in apples, Mr. E. J. Oinn reading paper read at Forest Range by Mr. G Monks some time ago. Various and contradictory suggestions were made by members as to the cause of the disease, and illustrations were given that appeared to indicate that it was due to some other cause than that usually suggested, viz., excessive vigour of growth and damp ground. The Hon. Secretary mentioned that some "Anne Elizabeth" apples on soil that this year was far moister than usual were freer from bitter pit than in former years. Members, however, had noticed that usually the largest apples were affected, the smaller fruits escaping damage. Members were of opinion that, whatever the cause of the trouble was, the fruit was affected quite a fortnight before it showed on the surface, and would develop on stored fruit apparently quite free when picked.

Exhibits. A large number of exhibits, comprising fourteen varieties of apples, four of pears, and one plum, were tabled. A few fruits were brought in for identification. Apple peelers and corers were shown at work, and discussion took place on the merits of the different machines.

Dowlingville, February 24.

Present -Messrs. Montgomery (chair), Mason, Phelps, Crowell, and Lock (Hon. Sec.), and two visitors.

Rust-resistant Wheats.—Considerable discussion on this subject took place, and the following varieties were mentioned as having escaped damage by rust, viz.:—Silver King, Marshall's No. 3, Carmichael's Eclipse, Gamma, Smart's Pioneer, Ward's Improved, and Neumann's Early.

Nantawarra, February 29.

Present Messrs. Dixon (chair), Sleep, J. W. and W. J. Dall, Herbert, Belling, Greenshields, R. and J. Nicholls (Hon. Sec.), and one visitor.

Maize.- Mr. J. W. Dall advocated growing maize for summer fodder. He thought under ordinary conditions it would thrive here. Mr. Greenshields agreed. He experienced no difficulty in growing maize in this district.

Black Rust. Mr. Sleep stated that he had suffered more or less from the effects of black rust ever since he had been farming. He had found the early sown always more affected than the later crops, and with this other members agreed. Members were satisfied that pickling with bluestone was not a preventive of black rust, and wished to know whether any treatment of the seed would be effective. [Mr. D. McAlpine, Vegetable Pathologist, Melbourne, states that pickling the seed for five minutes in a solution of 1 lb. formalin in 40 gallons of water will prevent this disease.—Ed.]

Takeall.—Mr. Greenshields stated that a crop of wheat on fallow land was last year badly affected by takeall. He wished to know whether it would be advisable to sow the same land to wheat this year. Members did not think so, and advised putting in a crop of oats. Mr. Greenshields thought he would do so, and sow strips of oats and wheat alternately, and watch results. The Chairman and Hon. Secretary had noticed that takeall spread rapidly in a wet spring, especially when rain is followed by muggy weather, whereas a strong, drying, north wind seemed to check its spread.

Hartley, February 26.

PRESENT—Messrs. Brook (chair), Jaensch, Reimers, Stanton, Wundersitz, Kutzer, Stein, and Fry (Hon. Sec.), and one visitor.

WHEAT SAMPLES.—Mr. J. Jaensch tabled samples of Petatz Surprise, Purple Straw, and Ranjit wheat. The latter was a very nice grain, long and heavy, weighing 66½lb. to the bushel. The crop averaged 25 bushels per acre. Mr. Stein tabled Tuscan and Marshall's No. 3 wheats. The latter has not been grown extensively in this district, but members intend to try it, as it promises to suit the locality. The Chairman showed plants of Majestic and Purple Straw wheat which had grown since the November rains. The heads of the former were filling splendidly, and the plant was practically free from rust, while the Purple Straw was badly affected.

Naracoorte, February 12.

PRESENT—Messrs. Forster (chair), Attiwill, Caldwell, McLay, Malone, Williams, and Cotton.

HARVEST. Discussion on harvest returns took place. Considerable damage by rust was mentioned. Gallant wheat was very strongly recommended by Mr. Duffield as a good yielder and practically rust-proof

BRANDS ACT. The paper of Mr. Thomas Redman on the Brands Act, read at the meeting of the Kingston Branch Agricultural Bureau on December 5, was taken into consideration. The Chairman generally approved of the paper He strongly favoured some means of checking travelling sheep as they went along, and he believed the waybill, safeguarded by stringent penalties if not filled up as required, as being the best. Clauses 26 and 27 of the old Act, as since repealed, quoted by Mr. Redman, seemed to be the remedy, and he strongly advocated an amendment of the Act in that direction. There was a good deal of sheepstealing carried on in the district, and the only way to trace them was by a waybill. There should be a drastic amendment of the law in the position of branding. The Branding Act provided for branding on the ribs and shoulder These positions were the most valuable part of the hide, and provision should be made for branding on the least important positions. Provison should be made for smaller brands. The 3-in. regulation size was too large. Mr. A. Attiwill was in sympathy with a great deal of Mr. Redman's paper. There had always been a good deal of sheepstealing going on in the district, but it was very difficult to trace it. It was resolved that this Branch generally concurs with the paper read by Mr. Redman at the Kingston Branch Agricultural Bureau on December 5 in reference to the Brands Act, and that they are strongly of opinion that the clauses in the Brands Act 111 of 1878 *re* waybill for travelling stock. repealed, should be re-enacted by Parliament

Port Elliot, February 20.

PRESENT—Messrs. McLeod (chair), Welch, Brown, Pannel, Gosden, W. E. and W. W. Hargreaves (Hon. Sec.), and one visitor.

FRUIT INDUSTRY. The Chairman read article from *Register* on this subject, and considerable discussion ensued.

Watervale, February 20.

PRESENT—Messrs. C. A. Sobels (chair), E. E. Sobels, Scovell, Ward, Beck, Holder, Hunter, Treloar, Croft, Ashton, Smith, Solly, Perrin, and Castine (Hon. Sec.).

ANNUAL REPORT.—The Hon. Secretary's report showed nine meetings held, with good average attendance. Three papers had been read and discussed. A vote of thanks was accorded to the retiring officers, who were re-elected.

Bute, February 29.

Present—Messrs. Trengove (chair), A. and H. Schroeter, Stevens, Barnes, Hamdorf, Commons, and Masters (Hon. Sec.), and three visitors.

Rust-resistant Wheats.—Discussion on this subject took place, the varieties most in favour being Gluyas and Marshall's No. 3. For hay Marshall's Hybrid is regarded as a good variety. Members state that little else than rust-resisting wheats are grown in this locality now, farmers considering it unwise to run an unnecessary risk of loss from rust.

Farm Motors.—Messrs. Geo. Wills & Co. forwarded particulars of cost and capacity for work of the Ivel agricultural motors. Members were surprised to note the low cost per acre for the work done, and the light weight of the 14 horsepower motor, and thought that if the first cost of the motors could be appreciably reduced there would be a great future before them.

Fruitgrowing.—Mr. Commons tabled splendid samples of grapes grown by himself, and stated that his orchard was doing splendidly, a large quantity of fruit having been disposed of this season.

Quorn, February 27.

Present—Messrs. Thompson (chair), Cook, Smith, Rowe, McColl, Brewster, Toll, Patten, Noll, and Walker (Hon. Sec.).

Lucerne.—Specimens of grapes, maize, and lucerne were tabled, and some discussion on lucerne took place. Mr. Cook found a small plot of lucerne especially valuable for his fowls during the summer. turkeys also were very fond of lucerne. To get the best results watering was necessary, and he strongly advised members to grow small areas. The Hon. Secretary sowed seed in October, and, with the aid of water, had already made four cuts.

Fertilisers in Dry Areas.—Mr McColl initiated a discussion on the use of fertilisers in this district. It was necessary to exercise discretion in their use, as without sufficient moisture to cause the wheat to start he found the seed more likely to malt than if sown without manure. Last year's experience justified the use of these fertilisers. The portion of his crop that was manured gave a greater profit per acre than the portion unmanured, besides which he was sure of more grass on the manured land. In wetter seasons the manures would pay better still. He would not advise the general use of manures in the Far North, but in the ranges it would probably pay. Every one, however, would need to experiment for himself.

Morchard, February 27.

Present—Messrs. Toop (chair), Kitto. Kupke, Reichstein, O'Loughlin, Kirkland, McDougall, and Beck (Hon. Sec.).

Poultry.—Mr. Scriven forwarded a short paper on the management of poultry on the farm. To get over the lack of green feed during the summer he advised soaking chaffed green hay in boiling water and mixing it with the morning feed. He was afraid it was impossible to entirely get rid of tick, as the stables and sheds were almost sure to be infested, but by burning the old fowlhouses and erecting new ones with the perches swung on fine wire the fowls would not be much troubled. A corner should be made dark and also crow proof for the hens to lay in.

Show.—It was decided to hold a show of products of the district under the auspices of the Branch.

Cherry Gardens, March 8.

Present—Messrs. C. Lewis (chair) J. Lewis, Hicks, Broadbent, Burpee, and Ricks (Hon. Sec.).

Codlin Moth.—Several members reported that this insect did not appear to be so plentiful this year, even in unsprayed gardens, and thought some parasite was keeping them in check.

Eudunda, February 29.

Present—Messrs. J. von Bertouch (chair), Schiller, Walter, Schwarz, Kluske, and one visitor.

Wheat Experiments.—Mr. Walter tabled sample of Theis wheat, with which he was well pleased; also Gamma wheat, which he strongly recommended for cultivation in this district. He sowed 53 lb. of seed on 1¾ acres, and harvested 84½ bushels, the plant being quite free from rust.

Summer Fodder.—Mr. Kluske tabled sample of amber cane from the Bureau experimental plot. The crop was 5 ft. in height, the stems rather thin, but, on the whole, growth was satisfactory. Stock preferred it to Johnson grass.

Port Pirie, February 27.

Present—Messrs. Wright (chair), Lawrie, Johns, Jose, Teague, Morrish, Bell, Smith, Hector, and Wilson (Hon. Sec.).

Annual Report.—Eleven meetings held, with average attendance of 7.3 members; four papers only read during the year. The Hon. Secretary strongly appealed to members to attend more regularly, and to take more interest in the work of the Branch. He suggested the adoption of the practice of drawing up the programme of subjects for discussion during the year. This was adopted, and a member made responsible for the main business of each meeting. It was also decided to look into the question of non-attendance of certain members. Delegates reported on proceedings of Conference at Gladstone, and expressed regret at the apathy displayed by the Branches.

Prolific Sheep.—Mr. Lawrie reported that from twelve Merino ewes he had eighteen lambs.

Koolunga, February 25.

Present—Messrs. Butcher (chair), Button, Palmer, Jose, Buchanan, Butterfield, Atkinson, Burgess, Lawry, and Noack (Hon. Sec.).

Horsebreeding.—Mr. G. J. Buchanan read from October, 1903, issue of *The Journal of Agriculture* paper by Mr. W. Robertson, of Wilmington Branch. Considerable discussion ensued. Mr. Butcher thought that stock of all kinds would benefit from the improvement in pasture resulting from the use of fertilisers. For the farmer to make a success of horsebreeding a stallion must be kept on the farm. Mr. Burgess attributed the failure of stallions to get foals in many instances to the mares being worked directly after service. Mr. Lawry criticised adversely paper on "Horse-shoeing" in report of Lyndoch Branch, in February issue of *The Journal.*

Gladstone, March 5.

Present—Messrs. Brayley (chair), Rundle, Burton, Cook, McDonald and Wornum (Hon. Sec.).

Fruitgrowing.—Discussion took place on reading of article from *Journal of Agriculture* on the selection and planting of fruit trees.

Membership.—It was decided to strictly adhere in future to Rule 4 of officers' conference *re* attendance of members.

Golden Grove, March 3.

Present—Messrs. Milne (chair), McEwin, Maughan, Harper, Angove, Ross, Rawlings, N. J. and A. D. N. Robertson (Hon. Sec.).

Bureau Show.—Considerable discussion took place on Mr. Maughan's suggestion to hold an annual show of products in connection with the Bureau. It was decided to hold a show next February, and a sub-committee was appointed to make preliminary enquiries on the subject.

Rhine Villa, February 29.

Present—Messrs. Hecker (chair), Lewis, Start, Mickan, and Vigar (Hon. Sec.).

Manures for Dry District.—Mr. Lewis tabled specimens of crop grown on white drift sand in this locality. Some plants from the manured land were very good, while on the unmanured block the crop was not worth reaping. Members considered the exhibits a striking illustration of the value of manure, though it was stated that a number of farmers in the district still refused to believe that the practice of manuring was profitable. Dicussion took place on results of experiments carried out by the Hon. Secretary with various manures. Results are published in March issue of *Journal*.

Arden Vale, February 29.

Present—Messrs. Warren (chair), Pearce, Fricker, Starr, Willis, and Hannemann (Hon. Sec.), and one visitor.

Visit to Adelaide.—Mr. Willis reported on various matters of interest that had come under his notice during a trip to Adelaide. Information concerning Gluyas wheat, varieties of saltbush, harvesters, ploughs, etc , was obtained and referred to.

Harvest.—Discussion on the late harvest took place, and it was agreed that the average for the Hundred of Yarrah was 4 bushels; Hundred Wyacca, 3 bushels, and of hay, 15 cwt. per acre.

Standard Bushel.—Members strongly condemned the practice of testing the weight of wheat by means of the small scales used by wheatbuyers. It was almost impossible, with the small measures used, to arrive at the proper weight, and it was not uncommon for different buyers to give different weights from the one sample. It was resolved—"That the Council of Agriculture be requested to urge on the Government, as the custodian of correct weights and measures, that the present small scales should not be tolerated, and that a bushel measure should be adopted." Members thought that if a bushel measure was too large and inconvenient a quarter-bushel measure would be a vast improvement on the absurdly small measures now used. The action of the Council in reference to proposed tests of the value of bleached wheat met with approval.

Saltbush.—Mr. Fricker reported on the various saltbushes growing on the plains, and also on the annual saltbush which had spread rapidly during the past five or six years in the hilly country.

Mount Bryan East, March 5.

Present—Messrs. T. Wilks (chair), Teddy, Honan, Pohlner, Dunstan, J. and E. S. Wilks (Hon. Sec.), and several visitors.

Poisonous Plants.—Discussion took place on various plants reputed to be poisonous to stock. Members consider the Darling pea (Swainsonia) very injurious when in pod.

Sunflowers.—Mr. Pohlner wished to know whether a crop of sunflowers on fallow would be beneficial or otherwise to the wheat crop. [Only practical tests will determine this. Probably the moisture taken out of the ground by the crop of sunflowers would lessen the prospects of the wheat crop —Ed.]

Mount Remarkable, February 25.

Present—Messrs. Challenger (chair), Jorgensen, Foot, Giles, Morrell, T. P. and G. P. Yates, McIntosh, Karger, and O'Connell (Hon. Sec.).

Weeds.—Considerable discussion on this subject took place. Several members thought more active measures should be taken to enforce the law. Some found fault with the District Council for its inaction, while other members condemned the Act as faulty.

Wandearah, February 29.

Present—Messrs. Robertson (chair), Fuller, Dick, W. and R. Roberts, Stanley, E. H. and E. J. Eagle (Hon. Sec.).

Motors for Farm Work.—A lengthy discussion on the capabilities of the Ivel farm motor took place. Members thought the machine would be of great use on the farm, but regarded the price as prohibitive to farmers in this district.

Manures.—A short discussion took place on the quantity of manure per acre most profitable to use in this district, but no definite conclusion was arrived at. Other matters of local interest were discussed.

Inkerman, March 1.

Present—Messrs. C. H. Daniel (chair), Board, Kennedy, Lomman, and C. E. Daniel (Hon. Sec.).

Stock Complaints.—Mr. Kennedy reported that his bull, which had been lent to a neighbour, showed signs of impaction soon after he brought it home, and was now bad. Several other members reported cattle in the district to be suffering from this complaint, notwithstanding the presence of green feed in the paddocks throughout the summer. Mr. Board had lost several valuable ewes from what appeared to be the same trouble. The flock was running in a stubble paddock, but on being removed to a grass paddock no more losses occurred.

Virginia, February 28.

Present—Messrs. Hatcher, Taylor, Nash, White, Huxtable, Pavy, Strempel, Thompson, Odgers, and Ryan (Hon. Sec.).

Poultry.—Mr. Odgers read a paper on this subject, which was well discussed.

Davenport, February 25.

Present—Messrs. Trembath (chair), Hewitson, Holdsworth, Lecky, Roberts, Hodshon, McDonald, Tickle, Welby, and Pybus.

Hon. Secretary.—Mr. J. E. Lecky was elected Hon. Secretary, *vice* Mr. Pybus, who resigned.

Gardening for Amateurs.—Mr. W. Hodshon read the following paper on this subject:—His remarks applied mainly to this district, where frosts occur from May until August. Only the most hardy or quickly maturing varieties should be grown out of doors during these months, until latter end of September and October, when the soil is warm. If the ground is turned up and left rough during the winter, it is then, by being open to the heat of the sun, in condition much earlier for receiving the seed than if freshly dug up. By observing the following directions, as near as our climate will permit, success may be assured. First of all prepare the seedbeds carefully, and have the seeds on hand ready to plant as soon as the weather is right and the soil warm enough. Often seeds decay in cold and wet soil. To secure germination, moisture, heat, and a certain amount of air are necessary. A seed may retain its vitality for years, while, after germination has once commenced, a check of a day in the process may be fatal. It is just at this time—between the commencement of germination and the formation of the first true leaves—that it needs the aid of the gardener to secure favourable conditions. 1st. A proper degree of moisture, without being soaked with water. 2nd. A proper degree of heat, secured by sowing the seeds when the temperature of the soil is most favourable, and this for each variety may be learned from a careful study of the following hints and the experience of the most successful gardeners in our district. 3rd. Covering the seeds properly. 4th. Such a condition of the soil that the ascending stem can easily penetrate it, and the young roots speedily find suitable food. These points must be remembered when you are about to plant seeds. When the seedlings appear, every weed should be removed, and the crust which forms after each rain should be broken up, and the ground stirred as soon as it is dry enough to permit. The more frequently this is done, the quicker the plants grow. Pounds are wasted annually in Australia by people planting seeds, and afterwards leaving them to chance growing. The people who have not patience to care for seeds after sowing are those who blame the seedsman. Good crops in poor soil can be grown if the ground is trenched 1½ to 2 ft. deep, with a liberal amount of stable manure, dug or ploughed in, hen manure, bonedust, and plenty of wood ashes. The best is stable and hen manure mixed. Use this liberally, 3 or 4 in. thick all over the ground, not in small spaces, as is usually done when making hills for pumpkins and melons. It is very noticeable in any season, especially a dry one, how much better the crops grow where this is applied than where other fertilisers were sown. The soil retains the moisture, and from the start the plants grow quickly, and soon cover the ground and shade it before hot weather sets in. Hen manure is the best and least expensive; it is always ready to be gathered, as almost every one who gardens keeps some poultry. Fully nine-tenths of the failure of seeds to grow is caused by careless or improper planting. The first essential step towards securing a good crop is to procure good seeds; but the next step—which is of equal importance—is to know just how to plant them. Many people think it is sufficient if the seeds are put in the ground, and that if they fail to grow it was the fault of the seeds. One of the most important things is in preparing your seedbeds. The ground should be thoroughly broken up, mixing plenty of well decomposed manure with it. It should be made quite fine. For the small seeds it is much better to go to a little extra trouble, and sift it through a half-inch sieve. Never work the soil when wet, for it then becomes hard, and if the seed is planted when in this state a crust will form over it and prevent the tender seedlings from coming through. The depth to which seeds are planted depends upon their size. Fine flower seeds should be planted very shallow, not more than one-eighth to a quarter inch deep. Cover seeds with a thin layer of cow manure, dried and sifted fine, and water after with a fine rose. Cabbage, turnip, carrot, and seeds of this size should be planted about half an inch deep, while beans, peas, and corn should be from two to three inches. After planting the seeds, which should always be done in drills (even when sown in a small seedbed), it is necessary that the soil be pressed firmly down in order to bring the seeds in close contact with the moist soil. This may be done with the hand, a piece of board, or back of the spade. In his opinion the greatest failure in growing seeds is the drying of the soil after planting. The soil may be moist and the weather favourable for a few days after planting and just as the seeds are germinating, or perhaps above ground the soil gets dry, and the plants, being unprotected from the hot sun, are quickly destroyed. For shading:- Bran sacks opened out and tacked to stakes over the bed a foot from the ground are equal to anything for this purpose. It is a protection on cold nights, and can be removed during dull weather and as soon as the sun is off in the evening and replaced in the morning. Watering the seedbed constantly is the cause of seeds not growing. There are people who water heavily every night, and allow the sun to dry soil and seeds all up next day. Remember also, watering plants as soon as the sun goes down with cold water scalds the tender plants when it comes in contact with the stem on a level with the hot soil. Stand the water in the sun during the day, and water at about sunrise. The seedbed only requires sufficient moisture for them to germinate. Water with a very fine hose every second or third day, and do not let the sun dry it.. A small garden well manured and cared for will give larger returns and more pleasure than a large one only half prepared and neglected after planting. A lengthy and interesting discussion ensued, a number of questions being answered by Mr. Hodshon.

Waikerie, February 20.

PRESENT Messrs. Rowe (chair), Blizard, Vaughan, Perry, Rodgers, St[illegible], Burrows, Jaeschke, and Green (Hon. Sec.).

PRUNING THE MUSCAT VINE.—Discussion on this subject took place. Several members had success in pruning the Muscat Gordo Blanco on the rod and spur system, but others reported failure

Mount Pleasant, March 11.

Present—Messrs. Phillis (chair), Giles, Godfree, Thomson, J. and P. Miller, Tapscott, Royal, and Vigar (Hon. Sec.).

Red Rust.—Several members reported that varieties that escaped damage by rust three years ago, notably Blount's Lambrigg and Tuscan, were badly affected this year. Some discussion on Marshall's No. 3 wheat took place. Some members had purchased seed which developed into a white-strawed wheat, others had grown a purple-strawed wheat under the name of Marshall's No. 3; both appeared strongly resistant of rust. Some discussion on the value of rust-affected grain for feeding purposes took place. Several members stated that they had used this wheat with good results It was stated that many crops that promised four bags per acre had been reduced to 6 bushels, and in some cases as low as 2 bushels.

Port Broughton, February 25.

Present—Messrs. Harford (chair), Barclay, Pattingale, Dennis, Whittaker, Button, Tonkin, and Dalby (Hon. Sec.), and seven visitors.

Bathurst Burr.—The Hon. Secretary called attention to the prevalence of this weed throughout the district, and strongly advised members not only to destroy the weed on their own properties, but also to urge on the District Council the necessity for enforcing the law generally.

Onetree Hill, February 25

Present—Messrs. J. Bowman (chair), G. Bowman, Barritt, Blake Flower, Hogarth, Hould, Smith, Thomas, and Clucas (Hon. Sec.), and three visitors.

"Time is Money."—Mr. Barritt read a paper on "Time is Money: How to Save Both." There were plenty of farmers who were hardworking, hard-living, and very careful of any money that came into their hands, and who would be very surprised if they were told that every day they were wasting money in many ways. He would try to point out how money can be lost on a farm. He had been to plenty of farms in this State, where the owners have perhaps been living for twenty or thirty years, and what did he find? No gates, very often some brush pulled together, or the remains of an old winnower, with two or three barbed wires. Possibly on the average two of these have to be opened every day to get a cart or team through; by the time it is cleared away and put in place again five minutes have been lost, which will make ten minutes each day, to say nothing of the wear and tear of the opener's hands, clothes, and temper. Well, this ten minutes a day pans out to seven and a half days a year, and at 6s. a day represents £2 5s., or enough money to make at least five good, strong, four-barred, ten-feet gates, which could be opened and shut in a few seconds, and which if once a year are given a coat of gas tar, with as much kerosine as it will take, will last a lifetime, and be a great improvement to the appearance of the farm. Another way where a lot of time is wasted is in working with old, wornout tools. People think it would be extravagant perhaps to put away an axe because it had got worn down thick, or a spade or shovel that was worn a lot, but still just did, but really, when a tool gets past a certain point it is economy to either send it to a sale, where you would always find some one fool enough to buy it, or else throw it away. Take two men fencing, give one the best of tools and the other the wornout things, such as he had seen men working with at times. He believed the man with the former could do twice the work that he could with the latter. Allowing, however, only one-quarter more, see what happens in digging a mile of postholes in hard ground, at three yards apart, which would be about 586 posts. If A., with the good tools, did 40 holes a day, it would take him 14½ days; but B., only doing 30 holes a day, would take 19½ days, or a difference of five days, which, at 6s. a day, equals 30s., which would buy quite a stock of spades, shovels, picks, and bars. There are also many other things which if used save time. For instance, he found that in taking down a fence a tomahawk was the best tool for wire-cutting. They could go along with the tomahawk in one hand and something to chop on in the other—the back of an axe, for instance—after one blow the wire will always break, and a man could cut all the knots out almost as fast as he could walk along. Some people used a file, and would think it awful to cut wire with an edged tool like a tomahawk, but for any one doing much fencing it would pay him to buy a new one rather than do without, but an old one ground to a short edge is best. Another great saving would be in the more liberal use of paint, not only on the farm implements that are made of wood, but on the farm buildings and house. If a man spent 10s. on a pig and sold him in two months for £1 he would think he had done all right, but if he spent the 10s. on paint and on a very hot day sat in the shade and painted his wagon, drays, etc., and in other spare time painted his stable and house, he possibly would find in time that the 10s. spent on paint was quite as good an investment as the 10s. spent on the pig. It is much the cheapest way to buy the white lead, boiled oil, etc., and mix it themselves to whatever shade they wished. Considerable discussion ensued, especially on the subject of gates, and it was decided that this be the subject for next meeting, members to bring rough sketches and specifications for farm gates.

Whyte-Yarcowie, March 19.

Present Messrs. Hack (chair), Pascoe, Dowd, Hatherly, Makin, Kornetzki, Lock, Mitchell, and Faul.

Fodder Plants and Weeds.—Mr. Pascoe read a paper on this subject. He thought there were unbounded possibilities for South Australian stock-raisers in the cultivation of fodder plants where the land can be irrigated, or where the water level is within reach of the roots. Other crops, such as rape, rye, holcus, and sorghum, can be grown in drier situations. Lucerne, however, is the king of fodder plants. The difficulty with it in this district was the prevalence of frosts and strong, drying winds in spring. Around Adelaide, however, a number of landowners grow very heavy crops with the aid of irrigation. At Orroroo splendid lucerne was grown on land watered by the Pekina Creek. At the Hon. J. J. Duncan's Gum Creek Station 500 acres were under lucerne, and this did well without irrigation. Paspalum dilatatum had been strongly recommended as a drought-resisting fodder plant, and might, perhaps, do here. Members would like to try this plant. [Paspalum dilatatum is a splendid fodder plant under favourable conditions. Our northern country is, however, far too dry, besides which it is a very expensive plant to establish. It is mostly propagated by rooted pieces of old plants, as seed is very unreliable.—Ed.]

Burra, March 11.

Present—Messrs. McDonald (chair), Field, Goodridge, Arnold, Flower, Hawkes, and Harvey (Hon. Sec.).

Poisonous Plant.—The Chairman tabled plant with small "reddish-pink," pea-shaped flowers and long seed pods, which was alleged to be poisonous to sheep. [Plant is probably Lotus Behriana, and is reputed to be poisonous to stock.—Ed.]

Wheat Experiments.—Mr. Field stated that during past years he had experimented with over thirty varieties of wheat, and of these he considered Marshall's No. 3 and Purple Straw best suited to the district. Last year he sowed these varieties on 25-acre plots, applying one bushel of seed and 212 lb. super per acre. The whole averaged 33¼ bushels per acre, Marshall's No. 3 being 3 or 4 bushels per acre better than Purple Straw. The season generally was very favourable in this district, and many farmers reaped 20 bushels and more per acre with lighter dressings of super.

Burning Stubble.—It was agreed that where the land was to be cropped two years in succession it was necessary to burn the stubble. Members would not, however, regard such practice as "good farming." They consider the stubble should be grazed for at least one year.

Manured Hay.—Most members were of opinion that horses did better on hay grown on land manured with phosphates than on hay from unmanured land.

Port Elliot, March 19.

PRESENT—Messrs. McLeod (chair), Green, Welch, Pannel, W. E. and W. W. Hargreaves (Hon. Sec.).

FEED FOR DAIRY CATTLE.—The Chairman read paper from report of Penola Branch on growing feed for dairy cattle, and a good discussion ensued. Members consider rape too strong for dairy cows, tainting the milk Mr. Green advocated growing rape for green feed. Last year he cut his rye three times, and then stripped it when it was about 3 ft. in height.

DESTROYING WEEDS.—Several members advised putting a little salt on the stumps when chopping up the plants of Sodom apple (Solanum sodomaeum). Others suggested arsenic, but it was feared that cattle would suffer, as they often chew these old stumps

Wilmington. March 2.

PRESENT—Messrs. Robertson (chair), Bischof, A. and M Bauer, Lauterbach, Broadbent, Lehmann, Zimmermann, Sullivan, and Payne (Hon. Sec)

MEMBERSHIP.—It was decided to communicate with all Branches in reference to changes in method of appointment of members suggested by this Branch. Members recognise that each Branch may adopt a rule providing for the retirement of one-third of the members annually, but what was desired was uniformity of action, and this could only be obtained by the Council of Agriculture making it a rule that all Branches should follow the course suggested.

WORK OF BRANCH.—The Chairman pointed out what, in his opinion, the work of this and other Branches should include, and suggested various ways of keeping up the interest of the members in the work and making the Bureau of greater value to the State. He particularly urged the value of periodical visits to farms and the adoption of the question box. It was decided to have a regular "question box night."

POULTRY.—Mr. Sullivan read an interesting paper on this subject. He recommended choosing a nice, well-drained slope for the yards, which should not be too large, and should be enclosed with 6-ft. wire-netting. As little wood as possible should be used, galvanized iron being preferred for houses. He recommended making small houses on wheels, in order to be able to move them about. Nests can be made of kerosine tins cut lengthwise, and the straw must be renewed frequently. The water supply must be kept shaded and kept sweet. The vessels should be of wood or earthenware. He gave soft feed in the morning, with a little meat occasionally, and grain at night. To keep the houses free from vermin, sprinkle occasionally with Cooper's sheep dip or Quibell's disinfectant. The houses must be cleaned regularly. For preserving eggs he found one pound of water glass to five gallons of water as good as anything. As good all-round birds he recommended the Plymouth Rocks, Wyandottes, and Orpingtons, and for table birds the Wyandottes. A very interesting discussion ensued on the various points brought forward. Several members championed the Leghorn for egg production.

Caltowie, March 1.

PRESENT—Messrs. Hewett (chair), Graham, Lehmann, Potter, Neate, Jettner, and Royal.

GLADSTONE CONFERENCE.—Mr. Hewett reported at length on proceedings of Gladstone Conference, and strongly commented on the indifference shown by the members of most of the Branches which should have been represented. He also keenly criticised the paper read by Mr. Hector on noxious weeds.

HORSES EATING WHEAT.—Discussion took place on treatment of horses that had eaten a quantity of wheat. A Melbourne paper was quoted as the authority for the statement that doses of one tablespoonful of carbonate of soda in one and a half pints of water, given as quickly as possible after the discovery is made that the animal has been eating wheat, had never failed to relieve the animal.

Orroroo, March 18.

Present—Messrs. Moody (chair), Harding, W. and A. Robertson, Copley, Lillecrapp, Jamieson, and Tapscott (Hon. Sec.).

Dairy Cattle.—Article by Mr. Thomson in November issue of *The Journal of Agriculture* on purebred versus crossbred cattle was read, and short discussion ensued.

Rust-resistant Wheats.—Short discussion on this subject took place. Owing to this district being practically free from rust, members have little experience of the qualities of these wheats.

Standard Sample of Wheat.—Mr. W. Robertson read a paper on this subject. This matter had been frequently discussed, but they had not accomplished much. At the abortive conference held in August, 1900, it was stated by the merchants that a double standard could not be adopted owing to the extra expense it would involve. He failed, however, to see where this expense would come in. The present system was very unsatisfactory to the wheatgrower, and this had been brought forcibly under their notice during the past season. It was quite time the farmers combined and demanded a say in this matter. He would prefer the adoption of the American system, and have three grades, so that the farmers would be paid according to the quality of their wheat. Under the present system they were practically paid according to quality up to the standard, but got no consideration for wheat over the standard. The system of docking 1d. per bushel for each pound under the standard was a very unfair one; ½d. per bushel should be quite sufficient. He hoped all Branches of the Bureau would take this matter up, and that they would be able to accomplish something before next harvest.

Clare, February 26.

Present—Messrs. Birks (chair), Kelly, Carter, Knappstein, Martin, and Greenway (Hon. Sec.), and one visitor.

Fruitgrowers' Association.—Discussion took place on this subject, and it was decided to support the committee of the Fruitgrowers' Association in their endeavour to make that body thoroughly representative of the fruitgrowers of South Australia. A number of members intimated their intention of joining the Association, and endeavouring to induce other growers to do likewise.

Complete Harvester.—Mr. Martin introduced discussion on this subject. He had used both stripper and harvester during the past season, and after careful consideration of the work done by both machines was of opinion that the complete harvester was immeasurably superior. The harvester was a greater labour saver, besides doing first-class work. From 100 bags of grain from the harvester he got only half a bag of screenings and practically no broken grains. From the stripper working alongside he had 86 bags of grain, six bags of screenings, and a wagon load of "heads." Another great advantage of the harvester was that it could be used earlier and later in the day than the stripper, and on days during which the stripper could not be worked. Considerable discussion ensued, and it was agreed by those members who had used the harvester that it was a great improvement on the stripper. It has been stated that the harvester loses more grain than the stripper, but this has not been the experience of members, since if the wind is properly regulated the loss from the harvester is much less than that caused by the heads and floorings produced by the stripper and winnower. The discussion raised by many as to the harvester distributing weed seeds is not worthy of consideration. The initial cost of the harvester is no more than that of the stripper and winnower. The horsepower necessary is about 30 per cent. more, but this is more than equalised by the smaller amount of labour required. As regards the alleged intricacy of the harvester, this can be mastered by any man of ordinary intelligence. The ordinary stripper will not satisfactorily thrash tough, resistant wheats, whereas the harvester thrashes these tough wheats perfectly.

Naracoorte, April 2.

Present- Messrs. Forster (chair), Williams, Wardle, Colton, Duffield. Buck, Caldwell, Coe, and Schinckel (Hon. Sec.) and several visitors.

Codlin Moth.—Mr. Duffield read a paper on this subject, giving his experiences in combating the pest. He found it a mistake to remove the bandages as soon as the fruit was gathered, as on examining about twenty-five bandages on his trees in the beginning of August he caught some hundreds of moths. He considered spraying when the blossoms were on the trees effective in dealing with the first brood, but the later broods were far more troublesome. Some discussion on the paper followed; also on treatment of vines to prevent oidium.

Homestead Meeting.—This meeting was held at Mr. Duffield's homestead, and, after formal business was concluded, members inspected the orchard, which covers about seven acres of land. The trees were generally looking well, and the crops generally had been satisfactory. The visitors, including a number of ladies, were afterwards entertained by Mr and Mrs. Duffield, and a very enjoyable afternoon was spent.

Mallala, March 7.

Present—Messrs. McCabe (chair), A. and H. B. Moody, Nevin, Loller, Churches, Jenkins, W. and S. Temby, Worden, and Stephenson (Hon. Sec.).

Standard Bushel.—Mr. Stephenson initiated a discussion on this subject, and strongly condemned the delay last season in fixing the standard. A serious wrong was done to the producer, as a very large quantity of wheat was bought under last year's standard of 63 ℔. per bushel, and then, within a day or two of Christmas, the standard for the season was fixed at 61½ ℔. It did not require very much thought to see how unfair to the farmer and profitable to the buyer this practice was. In his own case he had to sell wheat weighing 61 ℔. at a deduction of 2d. per bushel under market price; yet within four days the standard was reduced 1½ ℔ and he had no doubt his wheat was sold by the buyer under the lower standard at practically full rates. He had considered this question very carefully, and could see no fairer way than that advocated by Professor Lowrie a few years ago viz., the adoption of two fixed grades. If this were done there would be some incentive to farmers to clean their wheat properly. Mr. H. B. Moody thought that until the whole system was changed there would be little chance of any alteration, as the wheatbuyers had the whip hand of the growers, who were not consulted in any way on this matter. He believed the best plan would be to adopt the system of auction sales of wheat, and moved—"That the method of fixing the standard bushel is very unsatisfactory, and we consider it advisable that the farmers should patronise the auction system in selling their wheat." This was carried unanimously

Saddleworth, March 18.

Present—Messrs. Frost (chair), Benger, Bee, J. H. and T Eckermann, Klau, Leeder, and Coleman (Hon. Sec.).

Wheat Experiments.- The Chairman and Hon. Secretary reported upon over fifty varieties grown this season, the larger number grown by Mr. Frost, who found Majestic, Field Marshal, Jonathan, Bobs, and Federation to be good. Members considered Dart's Imperial one of the best wheats ever grown but for its liability to take rust. It has been observed that wheats free from rust two or more years ago were affected much more this season.

Unpickled Seed Wheat.—It is recognised that pickling wheat with bluestone not only retards its germination, but in the case of cracked grain stops its growth altogether, so that untreated seed comes up quicker and thicker than pickled. Mr. Benger's experience last season confirms the above. The untreated seed yielded seven bags to the acre, while the pickled grain drilled alongside only averaged five bags. The variety was Marshall's No. 3, and though heads with smut were noticed in November here and there, he failed to notice any smut when stripping, or even to smell it.

Skinless Barley.—Samples of skinless barley and Algerian oats were tabled by Mr. Benger, who recommended this barley in place of Cape for green feed, as it yielded very well. The oats were plump and fine; the return was 37 bushels per acre.

Effect of Manuring.—Members reported that where manure is applied to the wheat crop the land appeared to be getting better year by year. This was especially noticeable on poorer soils

Harrowing after Drilling.—This is practised by many farmers, the wheelmarks on hilly land are covered, otherwise they are liable to wash out into deep ruts. Young weeds turned up by the drill hoes, which would probably have started to grow again, are again pulled about and killed, those pressed down by horses' feet while drilling especially. Harrowing is more important late in the season in checking weeds and leaving even surface.

Richman's Creek, February 29.

Present—Messrs. Freebairn (chair) F. H. and J. H. Lehmann, Gebert, J. and J. S. McSkimming, Knox, Roberts Wright, Nicholson, Mattner, Knauerhase, and Kelly (Hon. Sec.).

Rabbits.—Mr. A. Nicholson read a paper on this subject. The spread of rabbits in South Australia had been largely helped by thoughtless and thoughtful people. The former were those who introduced them to various parts of the North for amusement or sport; while the thoughtful people were those who, in the days when payment was made for rabbit scalps, carried the rabbits about and released them in pairs in favoured spots. In regard to their destruction it would be nothing less than a farce for their District Council to prosecute landholders for neglecting to clear their land while the neighbouring Council takes no steps to carry out the law. Phosphorised pollard was the most popular agent for destroying rabbits, but he was not favourably impressed with its value in this locality, as by the time the country is bare enough for the rabbits to take readily to the baits the results will hardly be worth the trouble. Besides this, there was considerable danger of loss of stock from the poison. Where the country is clear and the rabbits in burrows digging them out will dispose of them fairly easily. Some people flooded the burrows to drown or drive the rabbits away but it was quicker in the long run to dig them out. He found it a good plan to encourage the ants about the burrows. Whenever a rabbit is destroyed drag it near the hole and leave it. The ants will soon swarm about it, and he found that rabbits and ants did not live peacefully together Last year they had very few rabbits, but he thought they must have increased 200-fold, as they were exceedingly numerous. It was a great pity that unstocked land that would after the splendid summer rains have been a waving field of spear grass should be as bare of feed as a road owing to the rabbits The Chairman agreed that digging out was the best, but other members advocated laying phosphorised pollard about the holes. Care was, however, necessary in the mixing, otherwise it might fire. Mr. F. H. Lehmann dissolved the phosphorus in bisulphide of carbon, and as no lumps at all were left, the danger from fire was greatly reduced.

Balaklava, March 10.

Present—Messrs. Reid (chair), Baker, Anderson, Burden, Hams, Neville, Smith, Tiller, Thomas, and Black (Hon. Sec), and one visitor.

Wheat at Adelaide Show.—The Chairman stated that all three prizes offered for wheats grown by members of the Agricultural Bureau were won by the Lipson Branch. The competition was poor, the winning lots were unnamed, and personally he did not consider the sample a good one.

Weeds.—Mr. P. Anderson read a paper on this subject. Weeds he would describe as useless or objectionable plants, and they were too numerous to attempt to enumerate, nor was it worth referring to the many weeds that had flourished in past years. What concerned them most was how to deal with the weeds which were troubling them now. Many of the worst of these weeds were originally introduced as garden plants, others had been distributed in imported seeds, hay, etc., and every year they seemed to be adding new names to the already long list of weeds. The rapid spread of many of these weeds was doubtless due to the seeds being blown by the winds, but sheep were by no means a small agent in this work. Some of these plants are easily kept under control by cultivation; others do not seem affected in this way. When land is left out to pasture, these objectionable plants, not being eaten by stock, seed freely, and if not taken in time quickly add to the difficulty of extermination. Where weeds are spread over large areas their destruction will be a matter of considerable difficulty, and individual effort would be of little avail. If the Noxious Weeds Act were strictly enforced by the District Councils, and *bona fide* efforts made by the landholders to clear the adjoining district roads, he believed it would have a marked effect in preventing the spread of many of the worst weeds they had to contend with. Then they could also do much to prevent newly introduced weeds obtaining a hold if they would all make a practice of dealing promptly with any new weed that makes its appearance in their neighbourhood. Members are of opinion that the Noxious Weeds Act should be amended so that its provisions could be enforced without unnecessary expense.

Petina Well, February 27.

Present--Messrs. W. Penna (chair) R. Penna, Fiddaman, Johnson, and five visitors.

Wheatgrowing. Various questions connected with seeding operations were discussed. Mr. Giles did not consider it advisable to sow just now, as the rains have come too early and were not likely to continue, with the result that the seed would probably malt. He would prefer to wait until the end of March or beginning of April. Some favoured ploughing in the seed, but they required an attachment to the plough to level the ground. Three inches was considered deep enough to plough scrub lands in this district. The solid mouldboard was considered best for sandy land, and the prong mouldboard in stiff soil. Ploughing in seed on fallow land was favoured. In regard to pickling seed, some members would sow clean seed in dry land without pickling. Some members use 8 oz. bluestone to the bushel of seed Various methods of pickling were discussed, members being divided in their opinions.

Saltbush and Buckbush. The cultivation of saltbush was discussed Mr. Giles did not think it would pay farmers to devote any attention to this matter, but others though it would be worth trying. The question of how to make use of buckbush was raised, and it was suggested that it could be cut when young and stacked for use in times of scarcity

Oats and Barley. -Oats are not grown much here, though Cape oats will do well. English barley was also considered worthy of a trial, especially on old land as a change from wheat.

Cutting Mallee Shoots. Members considered it made no material difference in the aftergrowth when mallee shoots were cut, and they advised doing the work when burning stubble.

Kingscote, March 14.

Present--Messrs. Turner (chair), P. T. and C. J. Bell, Carter, Melville, Neave, Ayliffe, Wright, Nash, and Cook (Hon. Sec.), and two visitors.

Earmarks on Sheep. Some discussion on the registration of earmarks took place, and a motion favouring the practice was carried, most of the members being of opinion that two or more notches should be provided for.

Paspalum Dilatatum. Mr. Ayliffe reported having grown this grass for several years in the Mount Lofty Ranges, and found it an excellent fodder, doing well when once established, even on dry land. He had several hundreds of roots growing on his farm, and they were doing well. Mr. Cook invited members to inspect his plot of this grass. It was doing well on dry limestone soil. He found seeds very irregular in germinating, and advised buying roots in preference.

Longwood, March 26.

PRESENT.—Messrs. W. Nicholls (chair), J. Nicholls, E. J. and T. G. Oinn, Narraway, Mundy, Smith, Vogle, Hemer, Cheeseman, and Hughes (Hon. Sec.), and nine visitors.

STRAWBERRY BEETLE.—Mr. Cheeseman tabled grub very similar to but smaller than the grub of the cockchafer beetle. These were very numerous amongst his strawberry plants, eating the roots, and causing the plants to die. [This is probably the grub of the strawberry beetle. Owing to the fact that it works underground it is very difficult to deal with, and we know of no practicable method that has been adopted. The perfect beetles also do a considerable amount of damage above ground, but these can at least be checked by spraying the plants.—ED.]

FRUIT SAMPLES.—Five varieties of keeping apples, two late pears, and one of plums were exhibited. Some discussion took place on the fruit show to be held in the local hall on April 2.

FRUIT AND VEGETABLE PROTECTION ACT.—The proposed new Bill dealing with this matter was discussed, and a number of the clauses warmly criticised. It was decided to invite Mr. Quinn to attend a meeting on May 28 to discuss various clauses with local growers.

Clarendon, March 21.

PRESENT.—Messrs. Payne (chair), Morphett, Phelps, Piggott, Brooks Dunmill, Hilton, and Wright (Hon. Sec.).

FRUIT AND VEGETABLE PROTECTION ACT.—It was decided to invite Cherry Gardens Branch to co-operate in holding meeting to discuss proposed new Bill dealing with the control of fruit pests.

UTILISATION OF GULLY LAND.—Mr. T. B. Brooks read a paper on this subject. For many years potatoes have been the main produce of the rich gully land during spring and autumn in this district, a little barley or other fodder also being grown. Potatoes, at prices ruling lately, have not been profitable, and they required to turn their attention to some other crop. Mangolds under ordinary circumstances will yield heavily if planted about the end of July. Maize, kale, and rape should also be grown, for feeding to cows and other stock. Where mangolds are grown they can be removed in April and stored, and the land sown to barley and oats for green feed. Lucerne will do well in these gullies without irrigation, but requires light treatment the first year to get it properly established. If the lucerne plot is sown with barley in March, and given a good top-dressing of stable manure, green feed for winter use will be obtained, and a good crop of lucerne secured throughout the summer. Members generally agreed with Mr. Brooks. Potatoes at £2 per ton are considered unprofitable.

Stansbury, March 18.

PRESENT.—Messrs. Anderson (chair), Sherriff, Faulkner, Jones, H. C. and G. Pitt, and Cornish (Hon. Sec.), and one visitor.

ANNUAL MEETING.—Messrs. J. Sherriff and P. Cornish were elected Chairman and Hon. Secretary respectively for ensuing year. The Hon. Secretary read resolutions of officers' conference, and suggested their adoption as rules for carrying on the work of the Branch. Some discussion ensued, but no decision is recorded.

Mount Compass, March 12.

PRESENT.—Messrs. Jacobs (chair), Slater, Jenkins, Hutton, Peters, McKinlay, Sweetman, and Good (Hon. Sec.).

PASTURES.—A general discussion took place on results obtained by different members with various pasture grasses.

Petersburg, March 5.

Present—Messrs. Bottrill (chair) Cadzow, and Wilson (Hon. Sec.).

Poison Weed.—The Hon. Secretary reported that a number of cows had died suddenly near Yongala, and their deaths were attributed to poisoning caused by a weed growing in the paddock in which they were grazing A sample of this weed was tabled, and was considered to be identical with the plant illustrated on page 400 of February issue of *The Journal* (Lotus australis). This being the first meeting since August, 1903, various matters of formal nature were dealt with. [We trust that this means that Petersburg Branch intends to improve on last year's record.—Ed.]

Morphett Vale, March 15.

Present—Messrs. Bain (chair), Christie, Hutchison, Holly, Goldsmith, Pocook, Jones, McLeod, Forsyth, Deplodge, and Anderson (Hon. Sec.).

Discussions Mr Forsyth read selected article on selling produce in the dearest market, and recommending the feeding of crops on the farm and the sale of the stock, instead of selling the grain or hay at low prices. He also read clipping on lessons from the drought. Mr. Bain tabled large, spreading weed, new to the locality, which might possibly become a nuisance He also referred to the idea held by some farmers that wheat degenerated to drake, which most of the members ridiculed.

Utera Plains. February 27.

Present—Messrs R Deer (chair), J. Deer, J. Deer, jun., Abrook, R. J and H. West, Barritt, Guidera, Hornhardt, Hall, A. R. S and A. R Ramsey (Hon. Sec.), and six visitors.

Horses Mr. T Willett (a visitor) read a paper on breeding and management of horses. He strongly advocated purebred horses on the farm, and took exception to the crossing of blood horses with draught mares, and the reverse cross He thought that for the farmer the Suffolk Punch horse would be the most useful. They were smaller than the Clydesdale, but strong active, and quite heavy enough. The heavy farm horse was too slow; a lighter team would do more work in the long run. In carting he had often noticed that the shafters had very short back chains, causing the points of the shaft to raise very high With several horses in front pulling on the points of the shafts there is a strong downward pull on the shafters. With the shafts lower it would be less strain on the horses, and the leaders would pull better Some horses will pull well in double harness but not in single, others just the reverse. A great deal depends upon the training they get. He thought jibbing was mainly due either to fear or to the horse being chilled, and under such circumstances whipping would do no good. The best treatment would be to take the horse out of the vehicle and lead him around until he was warm, then harness him up again. Nothing was more annoying than to have a horse break the bridle pulling back. This could be prevented in the breaking-in process. Tie the horse up to a short post with rope instead of bridle, and if he is inclined to pull back, let him try until he finds that he only punishes himself. He will quickly realise that he is beaten, and will not be likely to try the experiment again when in harness. In feeding horses he considered better results would be obtained by giving a little feed often instead of large feeds at long intervals. It certainly is more troublesome to feed the horse eight times a day, but the horse will appreciate his food better and do justice to it. Something was needed to save the terrible jarring to the feet that resulted from travelling with iron shoes on metalled roads; possibly a little leather or rubber under the shoe would be an improvement For horses that were not much on metalled roads it was better to leave them unshod as much as possible.

INDUSTRY.

SUPPLIED BY THE DEPARTMENT OF INDUSTRY.

Labor Bureau.

Number of persons registered and found employment by Government Departments and Private Employers from February 26 to March 25, 1904.

Trade or Calling.	Number Registered.		Number Employed.
	Town.	Country.	
Laborers and youths	26	79	232
Carpenters	2	—	6
Masons and bricklayers	—	2	6
Plasterers	2	—	4
Painters	3	—	15
Plumbers and ironworkers	1	—	1
Boilermakers and assistants	1	1	—
Blacksmiths and strikers	2	—	—
Enginedrivers	2	—	3
Electrical wiremen	1	—	2
Compositors	2	—	—
Cook	1	—	—
Attendants and warders	2	—	1
Coachman	—	—	1
Apprentices	22	—	3
Cleaners	4	9	—
Porters and junior porters	5	4	—
Rivet boys	10	—	4
Totals	86	95	278

March 31, 1904

A. RICHARDSON, Bureau Clerk

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A COMPARISON OF THE F.A.Q. SAMPLE, 1903-4, WITH THE MARCH, 1904, SHOW PRIZE WHEAT.

By ARTHUR J. PERKINS, SECRETARY FOR AGRICULTURE.

In our June issue of last year I had occasion to review a pamphlet on seed wheat by Dr. N. A. Cobb, of New South Wales. I pointed out at the time that by a series of carefully conducted experiments he had succeeded in proving that great advantages accrue from sowing only large, plump, well-developed grains; that the removal of small, ill-developed grain resulted in more even germination, healthier plants, and, finally, heavier yields. I have no intention to-day of commenting any further on this important question, although it may not be out of place to add that there are at present effective graders on the market, and that it is to be hoped that some farmers will take advantage of them during the present season. I have referred to Dr. Cobb's pamphlet solely because of the systematic method of grading which he had adopted, and which I have had occasion to follow in connection with another line of work. With the true scientific spirit that characterises all his work, Dr. Cobb recognised at the outset that to speak more or less vaguely of "large" and "small" grain must necessarily lead to confusion, besides failing to bring home to those most concerned the lessons his experience had taught him. Every wheatgrower knows that the dimensions of wheat grains vary not only with seasons and varieties, but even in the same ear. When Dr. Cobb started his work no recognised standards defining accurately these different grades were then in existence, and, with a view to clearing away any possible misconceptions, he proceeded therefore to establish them. After a series of carefully conducted measurements he adopted finally six grades, based mainly on the breadth of the various grains. These grades he called respectively 325, 300, 275, 250, 225, and 200, the figures representing in millimetres the distances between the wires of a series of sieves in which the grains were caught, and consequently the breadth of the grains themselves. One millimetre is roughly equivalent to 1-25th of an inch; so that grade 325 would include grains the breadth of which equalled 3¼ millimetres, or, roughly, 13-100ths of an inch; grade 250, grains the breadth of which equalled 2½ millimetres, or, roughly, 10-100ths of an inch; and so on for other grades.

I wished to set out definitely, by way of a permanent record, what was the actual condition of the f.a.q. sample on which all our wheat is sold; purposing, moreover, to continue this work from year to year, with a view to accumulating evidence which might serve to illustrate the influence of season and methods on our main agricultural produce. It occurred to me, further, that if side by side with the f.a.q. sample could be set a sample of wheat of the season, adjudged by experts to be of the very highest quality, interesting information might be derived from the comparison. In this connection I have thought that I could not do better than have recourse to the prize wheat at the March Show of the Royal Agricultural Society. The purport of this paper is therefore mainly a comparison of these two samples, based on Dr. Cobb's systematic method of grading.

GRADING OF THE SAMPLES.

As is well known, the f.a.q. sample has been set at 61½ lb. for the 1903-4 season. At the March Show the prize wheat was exhibited by Mr. W. Clark, of Angle Vale. It was a well-grown sample of Petatz Surprise, which went 67 lb. 14 oz. to the bushel. How these two wheats graded out is shown in Table I. and in Figs. 1 and 2. Both illustrations should be compared one with the other, as they represent equal quantities of each sample separated into proportional quantities of each grade.

TABLE I.

Comparison of F.A.Q. Sample with March Show Prize Wheat.

Wheats.	Weight per bushel.	Grades.						
		325	300	275	250	225	200	Tlngs.
	lbs.	%	%	%	%	%	%	%
F.A.Q. Sample, 1903-4	61·50	0·43	2·88	21·20	42·49	17·69	12·57	2·74
March Show Prize Wheat, 1903-4	67·85	0·39	5·28	59·04	31·33	3·58	0·38	nil

Neglecting for the present all other considerations, let us see how from the above data the two wheats compare one with the other. We may note in the first place that whilst the greater portion of the prize wheat consists of the 275 grade, that of the f.a.q. sample consists of a smaller grade, viz., 250. If, on the other hand, we divide the wheats in two parts, the first consisting of the three larger grades, and the second of the three smaller grades and tailings, we find the prize wheat consisting of 64.71 per cent. of the larger grades and 35.29 per cent. of the smaller grades, whilst the f.a.q. sample consists only of 24.51 per cent. of the larger grades and 75.49 per cent. of the smaller grades. In addition to this, the f.a.q. sample, as might have been anticipated, is dirty, whilst the prize wheat is clean. The latter shows no tailings, whilst the former has 2.74 per cent., or, roughly speaking, 1¾ lb. of impurities and small shrivelled grain per bushel of 60 lb. The impurities consist mainly of chaff, bunt balls, barley and oat grains, drake, and dirt. To what extent the relatively high proportion over 30 per cent. of small grain in grades 225 and 200 reduces the value of the f.a.q. sample from the miller's point of view I am not at present in a position to say. I hope, however, at a later date to be able to give this question my attention.

SAMPLES COMPARED WITH DR. COBB'S TYPICAL EXAMPLES.

In the pamphlet to which reference has already been made, Dr. Cobb indicates what estimate he places on the value of different samples according to the way in which they grade out. His views on this matter are illustrated in Table II., and for purposes of comparison the grading of the two wheats we have under consideration is set side by side with his typical examples.

TABLE II.

Comparison of Dr. Cobb's Typical Examples of Seed Wheat with the F.A.Q. Sample and Show Prize Wheat.

Wheats.	Grades.						
	325	300	275	250	225	200	Tlngs.
	%	%	%	%	%	%	%
Dr. Cobb's First-class Sample ...	46·96	39·63	8·01	3·79	1·09	0·29	0·23
Dr. Cobb's Medium Sample	3·10	19·00	26·70	37·20	11·40	1·50	1·10
Dr. Cobb's Bad Sample	0·70	4·60	14·80	34·80	33·00	8·30	3·90
Dr. Cobb's Very Bad Sample ...	0·00	3·60	10·80	37·40	37·00	7·60	3·60
F.A.Q. Sample, 1903-4	0·43	2·88	21·20	42·49	17·69	12·57	2·74
Prize Wheat, 1903-4 ...	0·39	5·28	59·04	31·33	3·58	0·38	nil

In Dr. Cobb's view, therefore, the prize wheat comes somewhere between a first-class and medium sample, whilst the f.a.q. sample is very little better than a bad sample. It may, of course, be objected that Dr. Cobb was not dealing with wheat from the point of view of the dealer or the miller, but from the point of view of the sower. This objection, however, is hardly valid. Ultimately the wheat of greatest intrinsic value is the one which nearest approaches the condition in which it is put through the mill, and it cannot reach this condition except it pass first through sieves and cleaning machinery, which have the effect of removing impurities, light and small grains; and I take it, therefore, that from the point of view of *condition alone* a perfect seed wheat is the nearest approach to a perfect miller's wheat. It may, however, be urged with greater force that perhaps in fixing the standards quoted in Table II. Dr. Cobb has not sufficiently taken into account the existence of varieties with naturally small, but dense, grains. His standards refer in the main to purple straws. The prize wheat, on the other hand, which was an undeniably fine sample of Petatz Surprise, grades out to only 64.71 per cent. of the higher grades, against 94.60 per cent., shown by Dr. Cobb's first-class sample of Purple Straw. It seems probable, therefore, that, in judging of the value of the sample from such data a certain amount of latitude must be left for the varying development of different varieties, for, as a sample of seed wheat of the special variety which it represented, it is difficult to imagine that the prize wheat could have to any extent been improved upon.

REVIEW OF THE STANDARD SAMPLE QUESTION.

Whatever other points of detail may be brought to light by a closer examination of the two samples, there can be little doubt that in the March Show prize wheat and the f.a.q. sample, as hitherto dealt with, we have before us in graphic illustration on the one hand a first-class sample, and on the other one of unquestionably poor quality; and, unfortunately, the faulty sample is assumed to be representative of the bulk of the South Australian wheat that is exported. The dirty condition in which our wheat is put on the market has in the past frequently been the subject of bitter controversy, and casual perusal of back issues of *The Journal* testifies abundantly to the interest this question has awakened ever since it was first brought forward at Congress in 1893 by Mr. W. J. Gleeson, of Carrieton. Nor, indeed, is the reason of its abiding interest to growers of wheat difficult to fathom. It is the local practice to sell wheat on a fixed sample—fixed somewhat arbitrarily, in the opinion of some—each season by the Chamber of Commerce. There are many farmers who take a proper pride in producing a good, clean sample, and it is a source of constant irritation to them that they should not be in a position to command more for their 60 lb. of good clean wheat than their neighbour, whose sample, perhaps, contains from 2 to 3 lb. of rubbish per 60 lb. From his point of view, the clean farmer's arguments are irrefutable, for, to bring his wheat up to the standard of a high-class sample, not only is he put to additional expense but he is obliged to discard dirt and small grain, which his more careless neighbour is able to sell at the same price as his best wheat. What to his mind further carries on the face of it the appearance of injustice is that the same buyers, who refuse to give him more for his high-class sample, reserve to themselves the right of paying less for any sample that goes below their more or less arbitrary standard. Now, if, as its name implies, the f.a.q. sample represents an average of the saleable wheat of the season, that it should be arrived at by the mixing of wheats both above and below it, appears unquestionable; and if, therefore, wheats going below it are to receive less than current rates, it seems illogical, not to say unfair, that wheats going above it should not receive more.

On the other hand, the buyers retort that their transactions do not cover bags of wheat, but shiploads of them; that there exist no local facilities for blending or grading the wheats before shipment; that the nature of their transactions is such as to oblige them to sell in London on a standard fixed definitely for the season; that each season they take every precaution to arrive at a fair standard, but that when once that standard has been fixed and indicated in London, it matters little to them if occasional samples, as is inevitable, go above it; and, that as they reap no benefit from the purchase of an extra prime sample, so they can pay no more for it than for a wheat which just reaches the f.a.q. sample. As for wheats that are

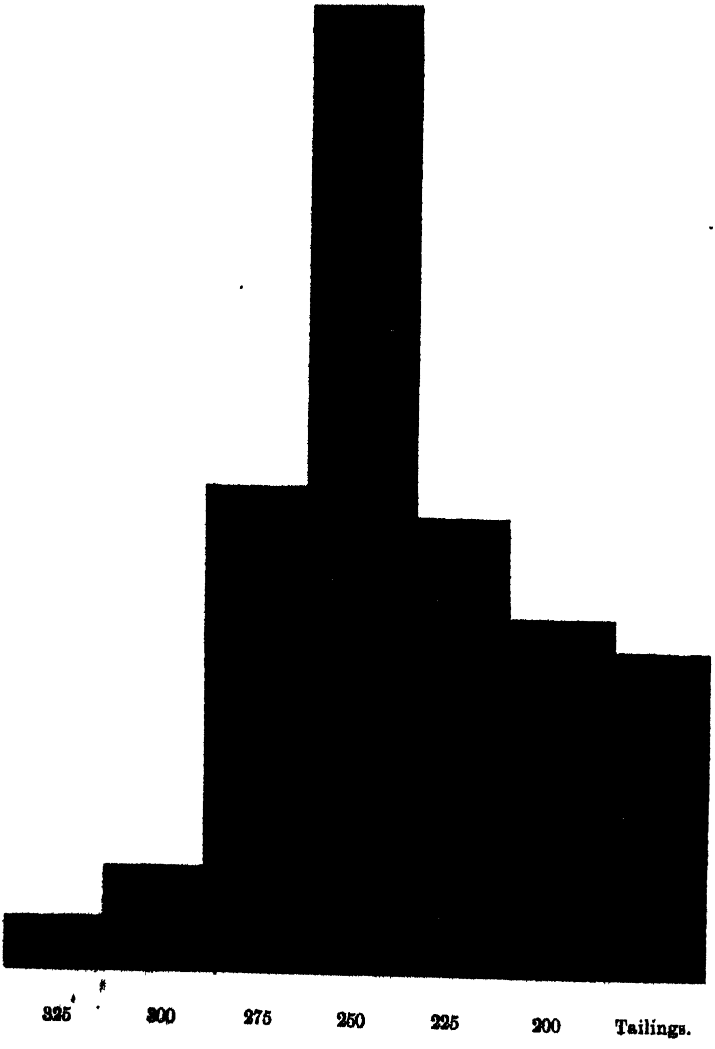

Fig. 1.—F.A.Q. Sample, Season 1903-4.

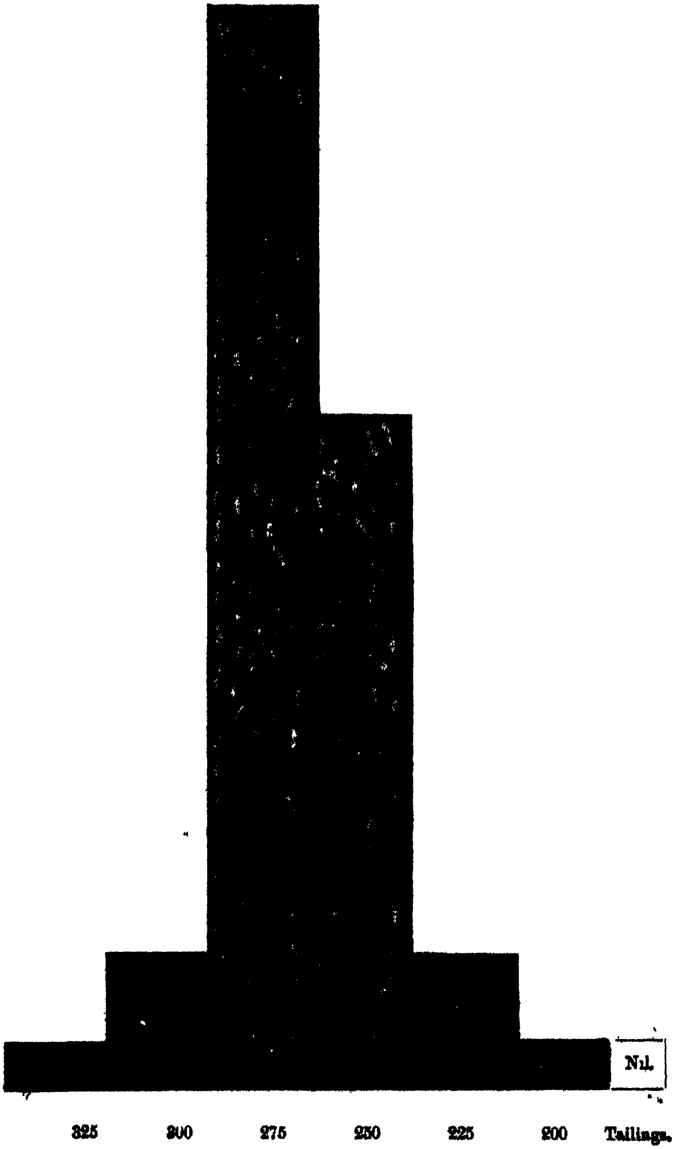

Fig. 2.—Prize Wheat, Adelaide Show, 1904.

below standard and "docked," they purchase them on their own responsibility, and, as they are liable to lose on them in London, they are bound to cover the risk at this end. The suggestion of a double standard, one for high-class wheat and another for inferior grain, made by Professor Lowrie, is rejected on the grounds of inconvenience and additional expense in handling, so that what pecuniary gain might possibly accrue to the farmer in one direction would be lost to him in another. And thus, unfortunately, all discussions and conferences on this important subject have invariably ended in a vicious circle, from which apparently there is no issue.

I believe that I have placed the position clearly and fairly from both points of view, and before dealing further with the matter there is one point to which I would advert that has, in my opinion, been responsible for much of the bitterness that has occasionally crept into such discussions. I refer to the name, "wheat of fair average quality," by which the standard sample of the Chamber of Commerce is known. In practice it is so essentially used as a *minimum*, and not as an *average*—for wheats below standard are "docked," whilst those above receive no more than current rates—that it is to be regretted that it should have received a name so misleading. This name and its well-known abbreviation have, perhaps, entered too much into common use to admit of any change in them being made at the present time. It would serve, however, much to remove some of the bitterness that attaches to this perennial controversy were the buyers to recognise in so many words what they are daily putting into practice in their purchases, that the standard on which they make these purchases is not an average of the wheat grown, but a minimum of quality below which they are not prepared to purchase at current rates.

The advisability of the adoption of a high minimum standard, or, let us say, a high f.a.q. sample, was strongly advocated by Professor Lowrie. He maintained that as most of the wheat sold was above the standards in force within recent years farmers must lose considerably thereby, and that if local buyers did not benefit by the losses of the latter, the surplus value of the wheat must eventually find its way into pockets situated outside the State. That there is a loss somewhere appears unquestionable: for if, for example, during the present season, five-sevenths of the wheat crop—and this is the proportion said to be represented on the average by the f.a.q. sample—is sold both locally and in London on the basis of 61¼ lb. per bushel, it is quite evident that, as this standard is the minimum for which current rates are paid, the bulk must be of higher quality, and must eventually be sold to some one at its real current market value. The profit goes to the last seller, whoever he may be.

It has been urged with a certain show of reason that everybody is interested in the production of an average sample of higher class than at present obtains, and that consequently everybody should lend a helping hand towards reaching it, but more particularly the grower. Before, however, pronouncing on the direction in which the latter's interest must lean, we should endeavour to ascertain to what extent others are equally or more interested in the same question. It is, of course, to the interest of the State as a whole that the produce of its soil should realise when leaving its shores its utmost market value, and thereby be exchanged against commodities of equal monetary value. The nearer, therefore, the apparently indispensable minimum sample, or f.a.q. sample, approaches the condition in which our most careful farmers market their wheat, the closer will we approach the attainment of this end At first sight the wheatbuyer may appear to have no special interest in the matter. He sells in other lands whatever he is able to purchase here, and as the magnitude of his transactions and the distance of the markets put sales by sample out of the question, he fixes his minimum standard sufficiently low to take in the bulk of the saleable product of the State in the condition in which it is the present custom to offer it. He can with reason state that it is not he who fixes the standard, but the wheatgrower himself. On the other hand, it is impossible to imagine that the buyer has any special interest in keeping the standard low. The higher the standard the higher the reputation of his wares. The easier, therefore, would it be for him to dispose of them on the world's markets. It cannot be doubted, therefore, that the minimum standard is low, because first-class samples are comparatively rare. And yet is it to the wheatgrower's interest to make them more general? It is certain that so long as the present system obtains, which allows of the sale of 2 lb. or 3 lb. of rubbish per 60 lb., at the price of prime wheat, it will be quite impossible to convince the average farmer that it is to his interest to put on the market a better sample of wheat. Where, in fact, is the inducement? The prospect of raising the value of South Australian wheat on the markets of the world is of too visionary a nature to appeal to his practical sense, nor, indeed, can he feel certain that he is likely in any wise to benefit thereby. If, therefore, an improvement in our general sample is a desideratum—and to my mind there is no doubt on the question—if such is the case, the first step must be made by the buyers, and not by the growers. The former, if they cannot see their way to the adoption of a double standard, must raise the only one in use, or else buy on sample like the millers, and surely, with a host of trained buyers in their service, the latter course is far from chimerical.

WEIGHTS OF INDIVIDUAL GRAINS IN TWO SAMPLES.

Whilst comparing the f.a.q. sample with the March Show prize wheat, I was led to make some further investigations, which I wish to put on record here, as they are likely to prove of use in connection with some other work which I have at present in hand. In Table III. are shown respectively for the two wheats the weights in grams of 100 grains of each grade, together with the number of grains calculated to be present in one ounce.

TABLE III.

Showing for Each Grade Weight of 100 Grains in Grams, together with Number of Grains per ounce.*

Grades.	Chamber of Commerce F A Q Sample, 1903-4.		Petatz Surprise Prize Wheat, March Show, 1904	
	Weight of 100 grains in milligrams.	Number of grains to the ounce, calculated.	Weight of 100 grains in milligrams.	Number of grains to the ounce, calculated.
Grade 325	5·3175	533	5·2111	544
„ 300	4·7799	593	4·7912	592
„ 275	4·4393	639	4·4103	643
„ 250	4·2825	662	3·8277	741
„ 225	3·2823	864	3·0014	944
200	2·8143	1,007	2·8863	982

* One pound avoirdupois corresponds to 453.592 grams, and an ounce to 28.349 grams.

Thus, from Table III. we gather that the 61¼ lb. f.a.q. sample consists on the whole of grains individually heavier grade for grade than the 67 lb. 14 oz. prize wheat, or, what amounts to the same thing, it carries a smaller number of grains to the ounce. It should be noted, too, that the average individual weights of grains of different grades vary within a very wide range.

DENSITIES OF VARIOUS GRADES IN DIFFERENT SAMPLES.

The weight of individual grains, however, does not appear to be a question to which much importance attaches, and if I have referred to it at all it is merely with a view to contrasting the results with those derived from the absolute densities of the various grades, a question otherwise important. In any case, a wheat such as Petatz Surprise, with its short, thick-set grain, must always in a comparison of this kind appear somewhat to disadvantage when set side by side with grains of other wheats of equal breadth but greater length. The weight per bushel of a sample of wheat, however, by which means, other things being equal, we judge of its quality, depends largely on the actual density of individual grains, *i.e.*, on their weight per unit of solid volume. For we must not forget that the weight per bushel, although it gives results sufficiently accurate for ordinary commercial purposes, does not indicate absolutely the mean density of the different grains of which it is composed. Much depends on the manner in which the grains pack. Small grains must necessarily pack closer than large ones, but at the same time, for the same weight they offer a greater outer surface, and consequently more numerous interstices. Whether a bushel of small grain would weigh heavier than a bushel of large grain of equal absolute density, I have not yet had the means of ascertaining. On personal judgment, however, I am not inclined to think so. If at times small "grained" varieties appear to weigh heavier than some large "grained" ones, it is, in my opinion, mainly because of the greater density of their component grains, a character that is probably inherent to the variety, and in no way connected with their size.

In the present instance, I wished to ascertain whether the larger grades of wheat were denser than the smaller grades of the same variety. If such were the case, and I was inclined *à priori* to think so, it would indicate that they were probably of higher feeding value than the smaller grades. Dr. Cobb appears doubtful on this point, but he does not seem to have taken into consideration the absolute density of the grains, which would indicate looseness or closeness of tissue, or the presence or absence of superfluous moisture. The results that I have secured are summarised in Table IV.

TABLE IV.

Showing Densities of Different Grades of Wheat, together with their Equivalents in Weight as Solid Bushels.

Grades.	Chamber of Commerce F. A Q Sample, 1903 4		Petatz Surprise Prize Wheat, March 1904 Show.	
	Density.	Weight per solid bushel	Density	Weight per solid bushel
		lbs		lbs
Grade 325	1 3590	108·840	1 4146	113 293
300	1 3523	108 304	1 4108	112 989
275	1·3736	110·009	1 3912	111·419
250	1·3281	106 366	1 3958	111·787
225	1 3514	108 232	1 3736	110 009
200	1·3689	109 633	1 3744	110 074

Before discussing the results, Table IV needs explaining. Under the heading "density" are given a series of figures varying from 1.3281 to 1.4146. This means that were it possible to get a solid mass consisting of the grains without the divisions that separate them in practice, a given volume of this mass would for each grade weigh the same weight as an equal volume of water at the temperature of 39.2 deg. Fah., multiplied by the figure expressing its density. These results are given for the sake of clearness in Table IV. under the heading "weight per solid bushel." Thus an imperial bushel is defined as a vessel holding 80 lb. of water at 62 deg. Fah. In view of the contraction of water at a lower temperature its contents would weigh 80.0885 lb. at 39.2 deg. Fah. If, therefore, we multiply the density of each grade by 80.0885, we get the weight of the solid bushel, *i.e.*, what a bushel of each grade would weigh were it a solid mass and not composed of a series of separate grains.

It will be noticed in the first place that although individual grains of Petatz Surprise in general weigh less than corresponding ones of the f.a.q. sample, yet on the whole the former are considerably denser than the latter, and inferentially richer in food material, and, therefore, of higher value. Thus, whilst grade 325 of Petatz Surprise weighs over 113 lb. per solid bushel, the same grade of f.a.q. sample does not reach 109 lb., and so on throughout the other grades. It will be noted, therefore, that it is not only dirt and chaff that lowers the weight per bushel. Much depends on the nature of the grain itself, independently even of its apparent plumpness or size.

With reference to my main point, it will be noticed that in Petatz Surprise wheat the densities of the different grades gradually lower as we pass from the higher to the lower grades; apart from two slight exceptions the fall is constant. Taking the two extremes, whilst grade 325 weighs 113 3-10ths lb. per solid bushel, grade 200 only just exceeds 110. The difference is, perhaps, on the whole, not very considerable, but it is sufficient to justify the assumption that in this case the larger grains are better matured and of higher feeding value. Whether this fact holds good for all cases is a matter which needs further investigation.

On the other hand, the grades of the f.a.q. sample show complete irregularity as to their respective densities. Thus, the heaviest grain is found in grade 275, and the next in grade 200, whilst the lightest is in grade 250. Such results were, however, to be anticipated in a mixed sample, and no conclusions either in one direction or the other can be derived from them.

I have in hand at the present time work connected with this question, which I hope to publish from time to time.

CLEANING AND GRADING SEED WHEAT.

In the June, 1903, issue of *The Journal of Agriculture* a résumé of Dr. N. A. Cobb's enquiries into the cleaning of wheat for seed, and the value of large, plump grain, as compared with small grain, was published. Numerous experiments, extending over several years, proved conclusively that large, plump grain yielded considerably better than the smaller grades of seed, and the annual waste of seed and loss of crop resulting from the practice of sowing improperly cleaned seed was vividly demonstrated. In view of the importance of this matter, the Department of Agriculture imported from Europe, through the Austral Otis Engineering Company, one of Mayer and Co.'s grain separators or graders, for the Agricultural College Farm. One of the Perfection Graders, manufactured by the Herman House & Co., of Ontario, and imported by Messrs. Clutterbuck Brothers, of Adelaide, has also been purchased by the College authorities. With a view to testing their value, arrangements were made with Professor Towar for a short trial of the graders on April 25, in the presence of the Agricultural College Committee of the Council of Agriculture. Messrs. A. M. Dawkins (chair), A. Molineux, R. Marshall, T. E. Yelland, and W. L. Summers (Secretary), together with Professor Towar and Mr. H. Roediger, were present at the trial. Mr. E. R. Emery (Farm Foreman) looked after the Mayer Grader, and Mr. Tylor (of Messrs. Clutterbuck Brothers) had charge of the Perfection Grader. Owing to various causes the trial was not a thoroughly satisfactory test of the comparative merits of the two machines, but it demonstrated their value for cleaning and grading wheat.

About three bushels of King's Early wheat from the threshing machine was thoroughly mixed with several pounds each of oats and barley. This was done because the grain from the thresher is already freed to a large extent of foreign seeds. The wheat was then divided into two parcels and put through the machines, with the following results:—

Name of Grader.	Weight put through.	Time occupied.	First Grade.	Second Grade.	Third Grade.	Oats and Barley.	Screenings.
Mayer	102 lbs.	8 mins.	82¼ lbs	4 lbs.	2 lbs.	10¼ lbs.	2½ ozs.
Perfection	105½ lbs	13½ mins.	92 lbs.	1 lb.	2½ lbs	9¼ lbs	2½ ozs.

The difference in weights put through the two machines is due to some being spilled while being placed in the hopper of the Mayer grader. The weight of screenings in the Mayer is estimated, as most of the small seeds and chaff are blown out of the back of the machine, and are not caught in any receptacle.

THE MAYER GRADER.

This machine is very neat and compact, is built mainly of iron, has few parts to get out of order, and should last a lifetime. There is very little woodwork about it to warp or crack. From the hopper to the lowest spout the grain passes through continuous circular sieves of varying meshes. Owing to the construction of the machine the hopper is necessarily some height from the ground, while the first grade spout is not more than five or six inches above floor level. This makes it necessary to raise the machine a little, and to arrange some means tor raising the wheat to the hopper. The rate of feeding is very simply regulated, and a few short trials would enable any one of ordinary intelligence to obtain the best results. The machine is guaranteed to grade 19 bushels per hour, something over the rate at which it was worked. A steadier pace results in fewer wheat grains going over with the barley and oats. The machine is worked by hand, and the draught is very light, the work being best done when the wheel is turned at about 60 revolutions per minute. The first grade turned out by the machine is a splendid sample, and wonderfully free from foreign seeds, only a few plump barley grains being detected in it. No. 2 grade is a good feeding grain, free from impurities, except a few grains of barley.

This machine also has sieves for separating wheats and oats from barley and barley and wheat from oats, but these had not been tried at the College It was therefore decided to put the oats and barley through with the sieves altered. The result was a splendid clean sample of barley, but owing doubtless to want of experience the oats were not well cleaned of the barley.

THE PERFECTION GRADER.

certainly easier to fill than the Mayer, but the work is slower, and the draught a little heavier, but still very light. It is not so substantial, and being constructed so largely of wood is more likely to warp and get out of order unless very carefully looked after. Owing to one of the sieves being missed, the first grade practically included Nos. 1 and 2, and was not equal to No. 1 of the Mayer. There were, however, more foreign seeds, particularly of oats, in the Perfection sample. The screenings contained a large quantity of poppy and other small seeds. The machine failed to separate oats from barley or barley from oats, but this was most probably due to the sieves not being properly arranged, the operator not having used the grader before.

As previously stated, the trial could not be regarded as a true test of the merits of the two machines, both of which did splendid work with a very bad sample, the proportion of oats and barley being greater than any farmer would have under ordinary circumstances. There is no doubt, however, that in the most important grade, viz., the first, or seed wheat, the Mayer did the better work. The simplicity and durability of this machine also favourably impressed the visitors. Most of the defects in the work of both the machines would in all probability be overcome with a little experience on the part of the operators.

The Mayer grader costs £34 10s., against £22 10s. for the Perfection machine. For the purpose of the farmer, however, whose sole object would be to clean the grain for seed purposes, the working parts of the machines should be capable of considerable reduction, with the consequent cheapening of the price of the machines, as at the outside it would not be necessary to have more than first and second grade, screenings, and foreign matter, as the grain is already partly cleaned by the harvester, thresher, or winnower, as the case may be. In order to lessen the outlay, ten or a dozen farmers should combine to purchase a grader, or else arrange for one of their number to buy the grader, the rest guaranteeing to pay so much per bushel for cleaning their seed wheat, or to hire it for a certain time. Taking the Mayer grader at an average of 15 bushels per hour, a farmer could put through 120 bushels in eight hours, and the work would be done during the latter part of the summer, when other farm work is relatively slack. Smaller, and consequently cheaper, sizes of the Mayer machine are made, the one at the College being a No. 3.

EGG-LAYING COMPETITIONS.

When the proprietors of *The Sydney Daily Telegraph* initiated the holding of egg-laying tests in Australia a little over two years ago they could hardly have anticipated the interest that would be taken in them, nor the extent to which their tests would be copied in the other States. In our May, 1903, issue we published a short summary of the results of the first competition held at Hawkesbury. Now we have the results of the second competition at that place and of the first held in South Australia. The great interest aroused in the first competition at Hawkesbury led to comments in the American poultry journals as to what American birds could do, and ended in a sort of challenge from the committee supervising the test to American breeders to prove that their fowls could do better than the Australian birds. This challenge was accepted by three breeders, and altogether 70 pens of six birds each competed in the second test. The following particulars are taken from the report published in *The Sydney Daily Telegraph*:—

HAWKESBURY COMPETITION, APRIL, 1903, TO MARCH 31, 1904.

Owner	Breed	Age on April 1, 1903	Record of Eggs Laid					Market Value		
			During April to September.	During October to March	Total.	Average per Head.	Average Wei'ht per doz.			
		mths					ozs.	£	s.	d.
R. E. Warren, N.S.W	Silver Wyandotte	9	637	671	1,308	218	24	7	10	4
W. Wild, ,,	Black Orpington	7½	598	676	1,274	212⅓	25	7	3	1
W. F. Evenden, ,,	Andalusian	7	573	669	1,242	207	25½	6	14	6
C. A. W. Wiel, ,,	White Leghorn .	7½	522	703	1,225	204⅙	27½	6	8	1
Mrs. Hansel, U.S.A.	R.C. Br. Leghorn	17	711	492	1,203	200½	24	7	9	4
W. H. Ponton & Son, N.S.W. .	Langshan	7	647	548	1,195	199⅙	26½	6	16	3
A. Munro, N.S.W.	Buff Leghorn	6	638	552	1,190	198⅓	25½	6	19	8
J. Rone, ,,	Black Orpington	6	563	619	1,182	197	26½	6	2	9
G. Howell, ,,	Silver Wyandotte	7	693	487	1,180	196⅔	24½	7	8	3
W. K. Hays, U.S.A	White Wyandotte	11½	629	532	1,161	193½	26	7	7	8
Mrs. Kirby, N.S.W.	Buff Wyandotte	9	579	577	1,156	192⅔	23	6	10	5
S. Kendall, ,,	Silver Wyandotte	7	604	548	1,152	192	24	6	8	7
Elphinstone Brothers, N.S.W. .	Minorca . .	8	479	649	1,128	188	27	6	0	3
A. Wedlick, Vic. .	Black Orpington	7	530	594	1,124	187⅓	26	6	3	0
A. Arnold, N.S.W.	White Leghorn	6¼	529	593	1,122	187	29½	6	1	0
C. H. Wickham, ,,	Black Orpington	11	504	597	1,101	183½	23½	6	3	9
H. R. Harris, ,,	Black Orpington	5	538	562	1,100	183⅓	27	5	18	0
Mrs Scaysbrock, ,,	Black Orpington	11½	527	573	1,100	183⅓	27½	6	0	8

The balance of the pens laid less than 1,100 eggs, though six of them had a greater value of eggs to their credit than the lowest of the above, and fourteen had more than 1,000 eggs to their credit. It will be seen that a pen of Silver Wyandottes, as in the first competition, comes out on top, both in respect to total number of eggs laid and market value of same.

THE PRIZE-WINNERS.

The prize-money amounted to £102, and was won as follows:—

For the greatest number of eggs in the twelve months:—R. E. Warren (1st), £15, W. Wild (2nd), £10, W. F. Evenden (3rd), £7; C. A. W. Weil (4th), £6, Mrs. A. H. Hansel (5th), £5; W. H. Ponton & Son (6th), £4; A. Munro (7th), £3; J. Rone (8th), £2 10s., G. Howell (9th), £2; W. K. Hays (10th), £1 10s.; Mrs. N. Kirby (11th), £1; S. Kendall (12th), 10s.

For the first six months (winter test):—Mrs. A. H. Hansel (1st), £5; G. Howell (2nd), £4; W. H. Ponton & Son (3rd), £3 10s.; A. Munro (4th), £3; W. K. Hays (5th), £2 10s.; R. E. Warren (6th) £2; S. Kendall (7th), £1 10s.; W. Wild (8th), £1; J. Varley (9th), 10s.

For the greatest market value:—R. E. Warren (1st), £5; Mrs. A. H. Hansel (2nd), £3; G. Howell (3rd), £2; W. K. Hays (4th), £1; W. Wild (5th), 10s

For the greatest number of eggs in the last three months:—Cardwell and Messervy, 333 (1st), £3; R. E. Warren, 294 (2nd), £2; Arcadia Poultry Farm, 294 (3rd) £1 10s.; J. Rone, 285 (4th) £1; W. F. Evenden, 284 (5th), 10s.

Highest total from any pen for any month:—J. Rone (160 in August), £2

Mr. R. E. Warren's winning Silver Wyandottes laid steadily and well from start to finish. At the end of the first six months they stood sixth, but, gradually overhauling the leaders, they went to the top at the end of February, and finished with 34 eggs to spare. An important factor in their success is that they went right through without breaking into moult, but this must not be allowed to detract from their magnificent record of 218 eggs per hen. Like all the other successful Silver Wyandottes they are smallish in size, and have been moderate eaters throughout.

The American competitors have amply justified their acceptance of the committee's challenge to send better layers than those that had been tested here. Two of the three pens from the United States have exceeded by 90 and 48 eggs respectively the best record in the first competition, while the three have laid in the aggregate 53 more eggs than the three leading pens in the first test. The merit of their performance can only be adequately gauged by those who know in what bad condition the American hens entered the contest after the long voyage, and their achievement is enhanced by the fact that most of the hens moulted three times in the twelve months. Mrs. Hansel's Leghorns as profit-givers stand alone, as they produced their great tally of eggs on half the average quantity of food consumed by the whole of the pens. Mr. Hays's White Wyandottes have proved themselves ahead of any pens of the breed yet tested in Australia.

RESULTS COMPARED.

The conspicuous feature of the general success of the competition is that the production per hen increased from 130 to 163 eggs, as compared with the first test. No less than 15 pens eclipsed the record of 1,113 eggs with which the Grantham Poultry Farm won first place last year.

A comparison of the average egg production and the average value of the eggs per hen of the various breeds is instructive and interesting. As a guide, however, to the relative merits of the different breeds, no significance can be attached to the positions occupied by varieties in which there were only one or two pens competing. The following are the analyses:—

	Per Hen. Eggs.	Per Hen. Value. £	s.	d.
6 Rose-comb Brown Leghorns	200.50	1	4	10½
6 Buff Leghorns	198.33	1	3	3½
6 Buff Wyandottes	192.66	1	1	9
6 Anconas	180.00	0	19	2
12 Langshans	174.75	0	16	6½
24 Andalusians	173.91	0	17	4
84 Black Orpingtons	168.07	0	18	1¼
72 White Leghorns	165.07	0	17	6½
60 Silver Wyandottes	161.95	0	18	4
30 White Wyandottes	160.50	0	18	7
6 Jubilee Orpingtons	160.50	0	17	3
12 Minorcas	154.25	0	15	9
60 Buff Orpingtons	148.88	0	16	3
30 Golden Wyandottes	145.13	0	15	3
6 Single-comb Brown Leghorns	137.50	0	18	9½

EXPERT'S REPORT.

Mr. D. S. Thompson (Government Poultry Expert), who had charge of the birds, reports:—

"Our egg yield showed an enormous increase over that of the first competition, from the following causes:—A more favourable season, improvements in attention and feeding, and last, but not least, by the work of the competitors themselves in improving their laying stock and in the earlier breeding and maturity of their birds. Notwithstanding that the general average of eggs produced was so much larger than in the first competition, and the totals of the leaders this year are far away ahead of those of last, it is satisfactory to note that competitors, who have taken part in both tests with the same breed, have in most instances improved their production. This is shown by the following comparison:—W. F. Evenden (1st test), 768 eggs, (2nd test), 1,242; A. Munro, 804—1,190; Mrs. H. Bastin, 912—1,086; W. H. Tombs, 757—1,080; A. E. Henry, 1,020—1,081, Horwood & Dennis, 705—902; M. Ward, 1,026—901; W. B. Bull, 715—882 E. Waldron, 863—864; J. F. Brown, 945—857; Bosanquet Brothers, 881—825; W. Harris, 522—825, L. L. Ramsay, 618—817. So that it is not (with three exceptions) that these competitors have gone back, but that others have done much better than most of them, and two competitors, who were low down last year (Messrs. Evenden and Munro) have gone right up into the front rank. The weather throughout was favourable to a good production of eggs. There was plenty of rain, but it was periodic. At no time did we have a spell of wet weather sufficiently long to interfere materially with the laying. The winter months were rather dry, frosty, and cold, and as these frosts were followed by a fairly long period of damp, dull, cold weather well into the spring, the climatic conditions were undoubtedly in favour of the Asiatic varieties and adverse to the Mediterraneans. During the twelve months 15 hens died out of 420, the whole of the deaths being from ovarian troubles.

"THE SYSTEM OF FEEDING.—The hens have been fed on the simplest diet possible throughout the competition. The morning meal consisted of bran and pollard mash at 7 o'clock. The mash was scalded with liver soup two days a week, and on the other five days it was simply mixed with water, the quantity given being an average of about one imperial pint per pen, the big eaters taking considerably over the pint, and the small eaters a little under. In the afternoon, between 4 and 5 o'clock, the hens were grain fed, one pint, more or less, according to appetite, of crushed maize, and sometimes wheat. Cut-up liver was given twice a week, at the rate of about 2 oz. per head. Shell grit was always before them, and clean water was given every morning. In the way of green food, rape was fed for three months during the winter, when the grass was withered. For the other nine months the only green food the hens got was the natural grass in the pens. The rape was fed whole in the leaf, at the rate of about a dozen leaves to a pen every second day. The grain used consisted almost exclusively of crushed maize throughout the year. This shows the fallacy of the theories of most authorities in England and Australia, who condemn maize feeding for laying hens. Americans discovered simultaneously with ourselves that maize is a much-neglected poultry food. The demonstration of its value is alone worth thousands of pounds to a maize-producing State like New South Wales. Although we fed successfully on maize alone, we do not advocate feeding on that principle if wheat can be as cheaply obtained. But as soon as wheat is higher in price we have no hesitation in using maize exclusively. At equal prices we prefer its use alternatively with wheat, but we prefer good crushed maize to inferior wheat at all times. By inferior wheat we mean any but the best milling grain."

THE FINANCIAL ASPECT.—The cost of feeding was:—For bran, pollard, and grain, £102 18s. 4d.; meat, £15 9s. 4d., green food, £2 3s.; shell grit, £1 10s.; total, £122 0s. 8d. The prices of feedstuffs fluctuated considerably—pollard from 1s. 8d. to 9½d., bran from 1s. 4½d. to 7½d., maize from 3s. 9d. to 2s. 6d., and wheat from 6s. to 2s. 6d. per bushel. The market value of the eggs was £373 15s 2d., from which deduct the cost of feed, £122 0s. 8d., and a profit of £251 14s. 6d. is left on the 420 hens. Every pen showed a profit on the cost of feed, the pen returning the smallest value leaving a margin of 6s. per hen. The monthly range of prices for eggs was:—April, 2s. 3d. to 2s. 6d.; May, 2s. 4½d. to 2s. 7d.; June, 1s. 10½d. to 2s. 2d.; July, 1s. 2d. to 1s. 11d.; August, 10½d. to 1s. 2d.; September, 10d. to 11½d.; October, 11d. to 11½d.; November, 1s. 1d. to 1s. 2½d.; December, 1s. 1d. to 1s. 4½d.; January, 1s. 4d. to 1s. 5½d.; February, 1s. 4½d. to 1s. 5d.; March, 1s. 6d. to 1s. 9½d.

THE MAGILL COMPETITION.

Twelve months ago the Royal Agricultural Society followed the example set by *The Sydney Daily Telegraph*, and arranged for a competition at the

Boys' Reformatory, the birds being under the care of Mr. F. J. Button, the Superintendent of that institution. Notwithstanding the shortness of the notice to breeders more pens were entered than it was possible for the Society to accept. The following table shows the positions of the various pens at the end of the first six months, and at the conclusion of the test on March 31; also the average number of eggs per hen in each pen, and the money value of same:—

Owner.	Breed.	Record of Eggs Laid. During April to September.	During October to March.	For twelve Months.	Average per Hen.	Value per Hen. s.	d.
W. A. E. Smith ...	Silver Wyandotte	503	429	1,032	172	14	2¾
T. E. Crompton ..	White Leghorn ...	446	571	1,017	169½	13	4¼
J. von Bertouch ...	White Leghorn ...	383	620	1,003	167⅙	12	7¾
A. H. Padman ...	White Leghorn ...	437	561	998	166⅓	12	9¼
Sargenfri Poult. Yard	Silver Wyandotte	481	497	978	163	12	10⅔
W. F. Evenden ...	Andalusian ...	327	640	967	161⅙	11	10¼
J. Kluge	S. S. Hamburg ...	283	628	911	151⅚	10	2¾
H. C. Bennett ...	Silver Wyandotte	423	487	910	151⅔	11	7½
G. Walker	Minorca	254	621	875	145⅚	13	3¾
W. L. Child	Black Orpington ..	365	507	872	145⅓	10	9¾
W. H. Milford ...	White Leghorn ...	342	518	860	143⅓	10	9½
T. A. Caterer ..	Golden Wyandotte	484	366	850	141⅔	12	3¼
Keays & Tyler .	Black Orpington ..	466	375	841	140⅙	11	6½
W. C. Bennett ...	White Leghorn ...	311	520	831	138½	10	2½
P. W. Mellor ...	Golden Wyandotte	315	485	800	133⅓	9	11¼
H. Fleming .. .	Houdan	279	502	781	130⅙	9	3¼
Le Lievre Bros. ..	Minorca	343	410	753	125½	9	7¼
P. F. Bevan	Brown Leghorn ...	349	399	745	124⅙	9	7¼
Charles Wright ..	Brown Leghorn ...	312	436	748	124⅔	9	1½
W. Hannaford ...	Minorca	300	438	738	123	9	1¼
Uoolta Poultry Yard	Buff Orpington ..	318	401	719	119⅚	8	11¼
Best Bros.	Black Orpington .	211	365	576	96	6	5¼
Jos. Bower .	Minorca	172	393	565	94⅙	6	4¼
J. F. Mellor	Minorca	161	350	511	85⅙	5	8½
H. M. Pugh	Jubilee Orpington	195	252	447	74½	5	5
S. B. Shierlaw ...	Indian Game ...	83	208	291	48½	3	0

PRIZE LIST.

It will be seen that here again the Silver Wyandotte occupies top place, Mr. W. A. E. Smith's six Silver Wyandottes being the successful contestants. They laid 1,032 eggs, and carried off the £10 prize. Mr. T. E. Crompton's White Leghorns were second with 1,017 eggs, and secured the £5 prize; while Mr. J. von Bertouch's White Leghorns, 1,003 eggs, won third prize, £2. In the highest market value of eggs laid, Mr. Smith's Silver Wyandottes were again victorious, and took the £5 prize, with a value of £4 5s. 4½d., or an average of 14s. 2¾d. per bird. The second prize of £2 went to the Sargenfri Poultry Yard's Silver Wyandottes, with £3 17s. 4d. for their 978 eggs. The prize of £5 for the largest weight of eggs laid by any of the pens was taken by Messrs. A. H. & J. E. Padman, whose pen of White Leghorns laid 998 eggs, which weighed 1 cwt. 25 lb. 12¼ oz. Mr. J. Bower's Minorcas were awarded the prize of £5 for the best pen from an exhibition point of view The total number of eggs laid by the 26 pens of six hens or pullets each was 20,630; weight, 1 ton 4 cwt. 48 lb. 14¼ oz.; and market value, £77 7s. 8½d.

EGGS ACCOUNT.

Eggs sold for sittings, 12,018; eggs sold for market, 8,342; eggs not sold, including brokens, accident, replaced, and under-size, etc., 270; total, 20,630.

Eggs sold for sittings, £231 2s. 8d.; eggs sold at market, £36 1s. 7d.; total, £267 4s. 3d. Average market price of eggs per dozen for 12 months, 1s. 0½d ; market value of all eggs, £77 7s. 8½d.

FOOD ACCOUNT.

Wheat, £30 11s. 0½d.; maize, £3 1s. 3d.; barley and torrefied, £1 10s. 8d.; pollard, £12 10s. 10d.; bran, £4 13s. 10d.; copra cake, 13s. 8d.; linseed, £1 2s.; stale bread, £2 16s. 5½d.; liver, £5 3s. 6d.; bone, £1 15s. 0½d., green feed, £5 17s. 6d.; grit and toppings, £6 1s.; total, £75 16s. 9½d.

Allowing for the addition of the rooster to each pen for a period of the test, this works out at nearly 8s. 11d. per hen per annum for food. Even with the high prices prevailing during the winter and spring, this seems a high figure. Evidently the birds were good eaters, whatever they were as layers.

COMPARISONS OF BREEDS.

Breeds.	Pens.	Average per pen.
Silver Wyandotte	3	973.3
Andalusian	1	967
White Leghorn	5	941.8
Silver-Spangled Hamburg	1	911
Golden Wyandotte	2	825
Houdan	1	781
Black Orpington	3	765.3
Brown Leghorn	2	748
Buff Orpington	1	719
Minorca	5	688.4
Jubileee Orpington	1	447
Indian Game	1	292

The victory of the Silver Wyandotte at both these competitions has naturally led to a considerable amount of "crowing" on the part of their friends, and there is a decided tendency to boom the breed as the "best layers." A study of the results will, however, show that the competitions have merely demonstrated that egg-laying is quite as much a matter of "strain" as of "breed." In the Magill competition the Silvers certainly hold pride of place on the averages, but at Hawkesbury, while one pen is at the top of the tree, another is at the bottom. In comparing the Magill and Hawkesbury results it must be remembered that the former are very closely on a par with the results from the first competition at Hawkesbury, and there is no reason why we should not show an equal improvement in our second test, which is to be held at Roseworthy College. During the present year Victoria has taken the matter up, and a test will take place at Dookie College. While these tests are undoubtedly a splendid advertisement of the capabilities of selected birds, we are afraid that, judging from remarks that have been made in connection therewith, their practical utility is very much over-rated.

"JOURNAL OF AGRICULTURE."

From January 1, 1904, the "Journal of Agriculture will be posted to anyone resident in South Australia bona-fide engaged in the cultivation of the soil on payment of a REGISTRATION FEE of One Shilling per annum. Single copies will be supplied at 3d. each; back issues at 2s. 6d. per doz. The indexes of Vols. I. to VI. can be obtained by members of the Agricultural Bureau and subscribers desirous of binding their volumes.

A COMPARISON OF TYPICAL VARIETIES OF WINE GRAPES UNDER ROSEWORTHY CONDITIONS.

By Arthur J. Perkins and W. R. Jamieson, B Sc

It is just twelve months ago that we published in the pages of this *Journal* the results of some investigations into the immediate composition of typical varieties of wine grapes grown at Roseworthy The fruit referred to was picked during the 1903 vintage During the course of the past vintage, with a view to ascertaining the extent to which "season' might modify our earlier results, we repeated our investigations The latter are summarised below in tabular form, in conjunction with the previous season's results, for purposes of comparison —

Varieties	Spec Gravity of Juice		Stalks		Seeds		Rinds		Juice	
	1904	1903	1904	1903	1094	1903	1904	1903	1904	1903
			%	%	%	%	%	%	%	%
Shiraz	1105	1125	4 90	6 43	5 01	6 27	10 18	12 06	79 91	75 24
Malbec	1094	1100	4 59	6 47	4 41	5 66	12 21	13 07	78 79	74 80
Cabernet Sau	1097	1119	5 67	6 38	5 30	5 57	13 95	15 97	75 08	72 08
Mataro	1092	1083	3 81	4 55	3 93	5 40	11 36	10 70	80 90	79 35
Grenache	1104	1114	4 44	3 77	2 79	2 73	13 75	11 82	79 02	81 68
Carignane	1076	1114	3 59	3 02	2 40	2 35	11 48	8 73	82 53	85 90
Doradillo	1085	1077	3 61	3 76	3 19	2 12	8 86	10 84	84 34	82 98
Average	—	—	4 37	4 91	3 86	4 34	11 68	11 89	80 09	78 86

With reference to this table it should be explained that the stalks, seeds, and rinds have been obtained by direct weighings, whilst the juice is given by difference The figures indicating the specific gravities do not, unfortunately, represent those of the bunches actually examined, as through an oversight the latter were not taken They represent however, the average of the specific gravities taken for each variety in the ordinary course of vintage operations

The differences between the data for 1904 and those for 1903 are such as might have been expected from the differences in the respective seasons. Generally speaking, at Roseworthy the 1903-4 season was both moister and cooler than that of 1902-3, and as results of this difference we find slightly higher percentages of juice and lower specific gravities We would draw particular attention to the relatively high percentage of juice in the Carignane In 1903 it headed the list in this respect, whilst in 1904 it was second only to Doradillo. Cabernet-Sauvignon, as might have been anticipated, gave in each season the lowest percentage of juice

We are indebted to Mr L M Hodge, until recently a student at the College, for the immediate analytical work, which was conducted with extreme carefulness

CIDER-MAKING.

RESULTS OF INVESTIGATIONS BY F. J. LLOYD, F.C.S., F.I.C.

(Continued from page 495)

Influence of Locality on Apples

There is still another factor which appears to influence the composition of the apple juice, and that is locality Into this subject we have not yet attempted to enter fully, but the following results are interesting —

Composition of Juice from Kingston Blacks

Grown at	Sp Gr	Acid	Sugar	Tannin	Solids
Butleigh	1 0672	64	14 08	216	16 60
East Lambrook	1 0695	41	15 62	302	17 08

The Orchards

In the ripe apple as it hangs upon the tree nature supplies us with all the essentials for good cider But the apples will differ in quality Hence, cider-making commences in the orchard If the orchard be neglected no amount of care will convert its produce into cider that will compete with the produce of a well-stocked, well-kept orchard How to obtain the best fruit may seem to many a difficult problem To improve the orchards it is desirable for several reasons that the trees should be numbered, first, in order that specimens may be obtained from the same trees in consecutive years, and analysed and secondly, that graftings may be taken from those trees which are found to produce apples of good quality for cider-making The analysis should help materially in promoting the supply of good fruit trees, for, as the great variation in value between different varieties of apples becomes more generally recognised, greater care will, it is hoped, be taken in the planting of good cider fruit trees The system which is being adopted at Butleigh is to graft new trees with those varieties which have, after repeated analyses, proved to be the best This seems to me the most satisfactory method that can be adopted Analysis proves that apples of the same variety when grown in different localities differ considerably in composition Instead, therefore, of buying this or that variety, said to be of excellent quality, farmers would do far better if they endeavoured to find out which are the best apples produced on their own land, and commenced with cultivating these varieties It was to help farmers to do this that analyses of apples sent to Butleigh were made free of cost to the senders As new trees of good varieties come into use the older and least desirable varieties should be dispensed with Each soil has such an influence upon its produce that we cannot afford to neglect what may be termed its likes and dislikes. Hence, our first consideration should be to secure the maximum produce of the best variety that we know this soil is capable of producing Subsequently there will be time enough to experiment as to its capability of growing other varieties which have been proved in other districts to be valuable

Varieties of Apples

The number of apples which have been analysed at Butleigh is about 500, comprising many varieties Now, it is self-evident that all these varieties cannot be equally good, that probably some are quite useless, or even detrimental to the cider. In fact, from a careful study of these analyses, it is very evident that much has yet to be done to improve the cider fruit of this country. From at least one-half of the apples it would be quite hopeless to expect to make first-class cider. If we compare these results with those from apples used for cider-making on the Continent, we shall better appreciate how little has yet been done in England to improve cider fruit.

In a little work on agriculture, written for scholars in elementary schools by Les Freres de l'Instruction Chretienne, the following ten varieties of apples are stated to be among the best grown in France for cider-making. Appended to each is the analysis of the juice as given in a pamphlet published by the Syndicat Pomologique de France, showing the analyses of these varieties from specimens which were exhibited at the shows of that society during the years 1892-94.

Percentage Composition of Juice of French Apples.

Name of Fruit.	Average Weight of an Apple.	Juice extracted from 1,000 lbs. of Apples.	Density of the Juice.	Sugar in Juice	Acidity expressed as Sulphuric Acid.	Tannin.	Mucilage.
1st Season—	ozs.	lbs.		%	%	%	
Blanc Mollet ...	1·38	740·0	1·0740	13 85	·155	·210	·40
Doux Joseph ...	1·42	492·1	1·0916	18 15	·156	·528	57
Saint Laurent .	1 12	696 0	1·0750	15 26	·150	·255	·33
2nd Season—							
Bramtot	1·85	·664·8	1·0888	20·35	·194	·335	·15
Launette Grosse .	1 76	—	1·0820	18 10	·350	·480	—
Marechal	1 95	748·0	1·0780	15·25	·160	·510	·45
Medaille d'Or ...	1·15	—	1·0942	19·64	·188	1 120	·45
3rd Season—							
Frequin Audievre ...	1·28	769·0	1·0740	16·05	·125	·215	·14
Grise-Dieppois ...	1·16	499·1	1·1164	21·10	·155	·790	·27
Reine des Pommes ..	2·80	560·5	1·0700	16·25	260	·418	·29

Which, then, are the best or most desirable varieties to grow? This is a subject to which in the future special attention should be paid with a view to the cultivation of the best varieties and the gradual elimination of the others. But numerous observations will be needed. To answer this question many points have to be considered, several of which are purely horticultural. I shall merely dwell upon those of most importance It is necessary to discover and record for each variety:—1st. Its time of ripening. 2nd. The weight of a crop from a single tree year after year so as to eliminate the fluctuations due to season. 3rd. The volume of the juice of these apples year after year. 4th. The average composition of this juice. 5th. The kind of cider which the juice will produce when used alone.

Only by a combination of these five factors can we hope to ultimately arrive at a just estimate of the value of each variety of apple for cider-making. The first desideratum is that the apples should be late in ripening, it will subsequently be shown in this report that the later the period of making the cider the better the produce, and why this is. The second and third desiderata are self-evident. However good a particular apple may be, if the crop is very small or the proportion of juice very small, these facts must tell against its value. The fourth and most important consideration is that the juice should have a composition suited for cider-making. To determine what this composition should be is a most difficult problem. As the cider made in 1899 was the best produced during the course of these observations, we are justified in assuming that the juice then obtained was not far from being a fair example of what to aim at. The first characteristic of the juice was its high proportion of solids (15.57 per cent.), which also meant a larger quantity of sugar than usual. The amount of acid and the amount of tannin were on the other hand far below the usual percentages. These facts suggest some interesting hypotheses.

The analyses of apples show that the table varieties contain, as a rule, far more acid than the cider varieties. This acid probably accounts for the difficulty experienced in making good cider from table fruit.

Again, the low percentage of tannin suggests the question: Is it quite certain that the very rough-flavoured apples, which are generally believed to be the best for cider-making, are really the best? So long as cider was made for "the use of the men," one can well imagine that these constituents were valuable, for they helped to give the drink an acidity and roughness which only an agricultural labourer could appreciate, and which probably helped to make the cider last longer than it otherwise would have done. But the man who makes cider for sale must be guided by the desire that he who drinks once shall drink again. We know that it is frequently possible to have too much of a good thing, and this probably applies to acid and tannin in cider fruit.

The apples of 1899 were peculiarly rich in those indeterminable and unknown constituents to which the title of "extractives, etc.," is given in my analyses. Previous to 1899 I considered an excess of these constituents as detrimental to the manufacture of good cider. Moreover, experiments have shown that when they were diminished the cider was materially improved. Upon reconsidering these experiments in the light of the above facts, is is seen that the acidity and the tannin were in all of them at the same time diminished. While, therefore, the results obtained are undeniable, the previous explanation becomes doubtful, and we have yet to learn how far the improvement in the cider was due to the diminished extractives, and how far to the smaller quantities of acid and tannin present in the juice.

5. It is desirable for many reasons to know what kind of cider the juice of each variety of apple will produce when used alone. Such knowledge will probably afford us considerable insight into the cause of flavour in cider and also supply the data for a scientific system of blending.

A very large proportion of the apple trees growing in the West of England are unnamed and unknown, and some steps certainly ought to be taken to discover the names and the value of the many unknown varieties now existing. How excellent some of these varieties are has been shown from the analytical results obtained at Butleigh (see especially No. 14). A further striking illustration was obtained among some of the apples sent from the Somerset County Farm, at Bickenhall, of which neither the name, origin, nor history seems to be known. Of these, No. 10 is of quite exceptional quality; No. 6 and No. 4 are also good. No. 11, though rich in solids, contains too much acidity, and appears to be more of a dessert apple. It is evident that Nos. 2 and 9 are the kinds of apple which are not worth growing for cider-making, when we consider that the same land and the same season enable another variety to produce 50 per cent. more solid matter.

Composition of Certain Varieties of Apples.

Name of Apple.	Year.	Average Weight of Apples.	Percentage of Juice.	Specific Gravity of Juice.	Percentage Composition of Juice.					
					Total Solids.	Malic Acid.	Grape Sugar.	Cane Sugar.	Tannin.	Extractives.
		ozs.								
Buckenhall, No. 2 ..	1901	2·63	63	1·0538	13 03	·22	9 38	1·60	·108	1·722
,, ,, 4 ..	1901	2 16	49	1·0668	16·50	·17	11·56	2·18	·136	2·454
,, ,, 6 ..	1901	2 71	65	1 0679	16 84	·22	9·54	6 07	·342	·668
,, ,, 9 .	1901	1 78	63	1·0547	12 74	·56	7·97	2·74	·108	1·362
,, ,, 10 ..	1901	2 16	52	1·0828	20 88	19	13·16	2·56	·148	4 822
,, ,, 11 .	1901	2·06	59	1 0669	16·76	·94	9 03	4·29	·184	2·316
Lambrook Pippin, No 299	1901	1·52	59	1 0500	12 13	·70	8·17	·55	·172	2·538
,, ,, ,, 300 (frosted)	1901	2 16	68	1·0589	14·19	·76	7 93	2·89	·162	2·448
Butleigh, No. 14	1897	2·0	30 4	1 0790	20 24	·21	13 18	4 94	·300	1·610
,, ,, .. .	1898	1 3	50	1 0933	23 22	·40	18 18	2·22	·380	2 040
,, ,, .. .	1899	1·0	43	1·0925	24·32	·48	18 88	4·22	·206	·534
,, ,, .. .	1900	1·30	55	1 0934	23·16	·24	19 22	2 50	208	992
,, ,, (graft) ..	1900	1·72	50	1 1038	24 98	24	18·18	4·04	·258	2·262
,, ,, .	1901	1 64	43	1·0811	20·48	15	12 50	4·74	·168	2 922
,, ,, (yng. trees	1901	1 53	41	1·0791	19 34	38	10 87	4 06	·274	3·756
,, ,, .. .	1902	1·04	36	1 0885	21·64	·15	13 92	3·00	·244	4·326

In 1898 Mr. Neville Grenville purchased the apples from an orchard which though on a different soil, had the reputation of producing good cider. The juice from these apples proved to be of poor quality, the average specific gravity of the juice being only 1.0538, and the solids under 13 per cent., which was much below the average of the year for Butleigh. This shows the necessity of care when buying apples for cider-making. They ought to be paid for not merely by volume or weight as at present, but according to the quantity and quality of the juice they yield.

ACTION OF FROST ON APPLES.

Mr. J. H. Symes, being anxious to determine what effect frost had on apples, sent me some ripe Pippins (No. 299) and others of the same variety, which were frosted (No. 300). It will be seen that there is a close resemblance in composition between the two, except that the frosted apples were larger, and appear to have developed further than the others. Hence they gave more and richer juice. The acidity, tannin, and extractives are very similar in both juices; the only difference is the high proportion of cane sugar in the frosted apples, and this is not likely to be due to the action of the frost. We may therefore conclude that if frosted apples are not suitable for cider-making, as some believe, it is due either to changes in composition, not apparent from an ordinary analysis, but which might be discovered by special investigation; or to changes affecting the yeasts, etc., which grow on the apple, and produce a desirable or undesirable fermentation in the juice. It is quite within the range of probability that frost may destroy desirable organisms, and leave undesirable organisms alive, so that these subsequently get the mastery during fermentation, and so spoil the resulting cider.

GATHERING THE APPLES.

If in future we must strive to obtain better fruit for the manufacture of cider, in the meantime it is necessary that we should utilise to the best advantage that which we already possess. The first question which arises is, ought the fruit to be picked or allowed to drop? Undoubtedly it should be picked. At present much of the cider fruit of this country is left upon the trees until it drops, and is then collected into heaps on the ground, and exposed to the sun, air, and rain. It is disheartening to see how many farmers utterly ignore the necessity for cleanliness in this first stage of cider-making. On the 28th of October, 1897, I had occasion to travel for many miles in Somerset. It was an excessively damp morning; a very heavy dew had fallen during the night, and a Scotch mist hung over the land. In some places the apples were still unpicked, while hundreds, wet, bruised, and dirty, were lying under the trees upon the cold, damp grass—a tempting breakfast for slugs and worms, and every other variety of apple-consuming life, animal or vegetable. Every mould or fungus which came in contact with the apples was revelling in the ample store of sweet, moist food they supplied, and growing apace, consuming the best part of the apples, destroying their value for cider-making, and planting in the remainder the germs of a subsequent injurious fermentation and decay. In other places I saw men gathering the reeking-wet apples, evidently intent on making as much so-called cider as possible, utterly regardless of its quality. Now, as the same time, the same labour, and the same capital must be employed, whether men make cider worth 4d. per gallon or cider worth 1s. per gallon, it is extraordinary that a little more foresight is not exercised so as to do things at the right time and in the right way.

It is best to gather the apples by hand. This can only be done with short trees; where the trees are high it is necessary to shake the apples down with the aid of a long crook. The apples as they fall should be collected in a cloth, or, what is better and cheaper, a large net. This must be kept well off the ground. The fruit should not be allowed to drop. An apple which has dropped upon the soil, in the first place collects dirt; secondly, it is bruised; and thirdly, it soons begins to discolour and decay. The evil effect of allowing the apple to collect dirt is so self-evident that it needs no comment. Not only does it pick up dirt from the soil, but this frequently gives a distinctly bad flavour to the resulting juice.

To put this statement to the test Mr. Blake made an experiment which completely confirmed its truth. In writing to me he thus describes the test:—"An experiment made by me in 1890 was the manufacture of cider from apples that had been allowed to lie on the damp ground for a long time, with the object of determining for myself whether such apples would impart an earthy taste to the cider made from them, and I find that this has distinctly been the case. The farmer who kindly let me have those apples admitted the fact on my letting him taste a sample of the cider later on, and said it would be a good practical lesson to him not to let his apples lie on the ground for the future."

When the apple in a bruised condition is left exposed to the rain there can be no doubt whatever that much of its nutriment is washed out, and, the sugar being thus lost, the resulting juice is impoverished. Whether the apples, by being bruised and decaying, are any the worse for cider-making, is a point upon which there seems much difference of opinion. But it is only necessary to carefully examine a number of apples in a field "store" or heap, to see that any mould which is growing is always found on the bruised and decaying part. This mould will subsequently find its way into the juice, where its spores will act as ferments detrimental to the cider and will invariably give it a characteristic mouldy flavour. In such bruised apples the decay is not always of one kind, two varieties, "brown" and "black" rot, being easily recognisable. The latter is, I believe, universally regarded as bad: opinions differ, however, with respect to the "brown" rot. An experiment was therefore made to determine the effect of allowing the apples to get rotten, the apples being hand-picked and kept in a clean and dry place until a sufficient number were rotten to permit of analyses being made of both sound and rotten specimens. The results obtained were as follows:—

Composition of Juice from Sound and Rotten Apples.

—	Sp Gr.	Acid.	Sugar.	Tannin	Solids.
Sound	1·055	23	12 50	·54	13·70
Rotten (Brown Rot)	1 035	·18	12 19	·168	13·42

From these results it is evident that two distinct changes take place: first, the tannin is precipitated in large part by allowing the apple to rot, and so does not enter the juice; secondly, the acidity slightly diminishes, and there is a loss of sugar. The rottenness was that known as "brown" rot. The juice of the rotten apples was of a far darker colour than that of the sound apples, and upon keeping it in clear glass bottles, so that the changes taking place might be observed, it was found that the juice from the rotten apples cleared far more rapidly, as fermentation progressed, than that from the sound apples. Further, the apples lose considerably in weight by rotting, and their juice contains far more matter in suspension than that from sound apples, which probably accounts for its clearing more rapidly.

Whether under any circumstances the apples should be allowed to get rotten in a dry store or not may remain for the present an open question, and one for future enquiry, but there is clearly no doubt that the effects produced by allowing them to fall and rot on the ground are detrimental to the manufacture of good cider, especially if the apples be exposed to the rain. This custom, which is unfortunately almost universal in the West of England, cannot, therefore, be too strongly condemned. The apples should never be allowed to lie on the ground, even in heaps.

The next question is: When should the apples be picked? I am convinced that cider apples ought to be picked before they have become quite ripe. Immediately the apples from a tree begin to drop it is time for all the fruit upon that tree to be gathered. The apple appears to attain a maximum size before it commences to ripen. When once it has attained that size, and the process of ripening has commenced, nothing is gained by leaving it upon the tree. If left it merely ripens, and certain chemical changes take place within it by which the sugar increases, etc These changes, however, take place to the same extent if the apple is taken off the tree, and the connection between the apple and the tree does not, so far as I am able to judge at present, in any way affect the later stages of the ripening process.* If the apples have been picked before they are quite ripe they must be stored away to ripen. The best storing room is a dry, well-ventilated loft. the floor of which is divided into bins in which different varieties of apples may be stored separately. If no loft is available, they may be left in the wagons in which they were placed when first gathered, provided these wagons are covered or placed in a covered shed. Or the apples may be stored in the hurdle stores, described by Mr. Harper as follows:—"Every farmer has sheep hurdles upon his farm, which are only fully in use during the lambing season: in any case they cost but little. When the fruit is about to be gathered, drive a hurdle into the ground, strengthening it, if it is a high one, by driving a stake into the ground by it. Another hurdle should then be placed parallel to the first, and sufficiently near to allow of another being placed like a shelf upon the bottom rail of the first hurdle and the second rail from the bottom of the other hurdle A hurdle should be driven in at each side and the series may be continued an indefinite distance. Some use wreath hurdles, made of willow, with twigs interlaced between the bars. Others use a thick coating of straw or fern on the bottom, with some straw turned up at the sides to keep the fruit from running out. When the produce of a tree, or of several trees of one sort, has been gathered, it is put into this receptacle, which, as will be evident, is very easily put up. Apples stored in this way are kept off the ground, and the air can get under, over, and around them"

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* L. Lindet, who has made a study of the ripening of cider apples, comes to a similar conclusion. 'Compte-Rendus, 1893.

Some experiments were made with apples picked and kept in hurdle stores, the result was most satisfactory The apples were cleaner, riper, and less rotten than those obtained in any other way When in stores and under cover they can be left until opportunity arises for making them into cider. But where there is no provision for storing apples the cider-making has to be carried out at a breakneck speed, to keep pace with the fall of the apples

It is essential that the apples when in the hurdle stores should be well covered, so as to prevent the rain penetrating into the store Owing to the considerable amount of rain which fell at Butleigh during the months of November and December, 1895, this was not always ensured, and the result is well shown in the following analyses —

Composition of Juice from White Jerseys

—	Acid	Sugar	Total Solids
7th November—Picked from Tree	16	11 49	12 62
20th November—Placed in Hurdle Store	22	11 90	12 76
16th December—Taken from Hurdle Store, washed with rain	26	11 33	12 26

Evidently from these figures it is better, if possible, to store the apples on a dry floor in a loft, provided they are not packed too thickly and are moved regularly to prevent heating One advantage of this system is that the apples dry losing a little moisture consequently the gravity of the juice becomes greater, and the resulting cider stronger than it would be if the apples had been ground when wet This is shown by the following results —

Composition of Juice from Red Jerseys Stored in Loft

	Sp Gr	Acid	Sugar	Total Solids
22nd October	1 0617	15	14 70	15 44
5th November	1 0660	16	14 92	16 14

When Should Cider-making Commence? Temperature

No factor plays such an important part in the manufacture of cider as that of temperature The cooler the season the better the make Hence, cider-making should be delayed as long as possible It therefore follows, unfortunately, that the season most favourable for the ripening of the apples is not best adapted for the making of cider If, therefore, the ripening season is an early one, the make has to be put off longer than usual, and it is necessary to pick the apples before they have reached such a state of ripeness as would be permissible in a later season This is apparent when once noticed. In such a warm season the apples will not keep so well nor so long as could be desired, unless they are picked early, oherwise a certain amount of waste and decay will take place in the stores.

The Manipulation of the Apples

In the manufacture of cider at Butleigh an endeavour was made to carry out every improvement in a simple, practical manner, so that any cider-maker, without going to unnecessary expense, could do the same. Sufficient space for storing the apples and allowing them to get ripe did not exist there, more especially in a plentiful year, so that frequently the apples had to be ground a few days after being brought into the loft or storing-room. The apples were brought in, as on most farms, in a state which, although it does not satisfy scientific requirements, was universally deemed to be the best that could be secured. In other words, more or less material which ought not to be present is brought in with them. How to clean the apples and how to get rid of this extraneous matter has always been a difficulty with every cider-maker. But it must be done.

Mr. Neville Grenville secured it by a simple and yet effective contrivance. A trough of wood, about ten to twelve feet long, twelve inches wide, and with sides seven inches high, was made. This was placed in the storing room, with one end leading into the shoot which fed the mill, and the other raised about two to three feet from the floor on a wooden trestle. Along the bottom of this trough, at intervals of about two feet, were fixed slips of wood half an inch thick, nailed on diagonally and bevelled off on the side away from the mill. The effect of these strips was to slightly arrest the speed of the apples, and to cause their flow to be alternately from side to side of the trough, as they rolled down the slope from the upper end, where they were fed into the trough. A man or boy stood by the trough, and as the apples rolled along picked out all those that were rotten, gathering up from time to time the leaves, stems, pieces of rotten apple, and other extraneous matter which, owing to their inability to roll, were left in the trough and thus easily separated from the apples. The amount of useless material removed in this way from apples which to all appearance were fairly clean was astounding.

Subsequently an improvement was made to the trough which proved most valuable as a means of further cleansing the apples. This consisted of putting into the trough a false bottom of semi-circular laths. The laths are fixed to narrow strips of wood, which raise them two inches off the bottom of the trough, so that they form a grating. This grating is made in lengths of three feet. One length could thus be removed at a time for clearing out the refuse which had accumulated beneath it. The laths run parallel to the sides of the trough, about one and a half inches apart. Probably it would be best to have the bottom of the trough open, so that the dirt might fall through on to the floor, and thus do away with the frequent removal of the lath bottom for cleansing the trough.

The result of the removal of the dirt effected by the trough was most valuable as a means of further cleansing the apples. This consisted of putting clean. The colour of the cider was much lighter than when the rotten apples were left in. I would most strongly recommend cider-makers to adopt this simple system of cleaning the apples.

Another system of cleaning the apples upon which experiments have been made is by washing them. Washing apples for cider-making is a custom seldom, I think, resorted to in England, but it is practised in both Germany and Switzerland, and in both these countries most excellent cider is made. It is also being introduced into France, and a special apparatus is made for the purpose at Cherbourg. The first advantage that can be claimed for the process of washing is that it gets rid of the dirt. The possible disadvantages sometimes said to accrue are:—1st. That it washes out some of the sugar: and, 2ndly, That it washes the yeasts, necessary for the fermentation of the juice, off the apples. An elaborate examination of the influence of washing cider apples, so far as it affects the composition of the juice, has been made by Mons. A. Truelle, and published in the *Journal de l'Agriculture*, July-August, 1899, and those who are making a study of cider might, with advantage, carefully read this article. My experiments were on a large scale, and the apparatus at my disposal was not of the best. The best method of washing the apples in bulk that I could devise was to dip them, when suspended in special baskets, into a tank of water several times, and then allow them to drain and partly dry on a floor until sufficient were washed for a cheese.

Two cheese were made up from the same bulk of apples, one lot being washed, and the other lot unwashed. The specific gravity of the juice was, from—

Unwashed apples	1.057
Washed apples	1.056

The loss of the solid matter in the juice due to washing was therefore scarcely perceptible. As regards fermentation, this proceeded more regularly and only slightly less rapidly in the juice from the washed apples than in that from the unwashed apples, so that there would appear to have been no material loss of yeasts due to washing What little there was could probably do no harm,* as a slow fermentation is always desirable. The flavour of the cider from the washed apples was better than that from the unwashed apples.

Grinding the Apples.

The apples as they leave the trough pass into the mill. There are several mills at present in use. First, there is the old stone mill, which has many disadvantages, being slow and dirty. It certainly does crush the apples thoroughly. Another kind of mill is made of two iron rollers so cast that they fit into one another. These iron rollers do not separate the cells of the apple sufficiently. The mill simply crushes the fruit, and in no sense of the word can it be said to disintegrate it. Another mill is the "Tooth mill," having two stone rollers under it. In the top set of rollers the teeth of one roller fit into openings in the other These mills do their work fairly well. A still better mill is the one called a "Scratcher.' It is best for this reason, that it disintegrates the apple cell from cell. The Scratcher (Fig. 1) tears the fruit to pieces, and has the immense advantage of grinding as fast again as any mill known. The two stone rollers under a "Scratcher" are not necessary.

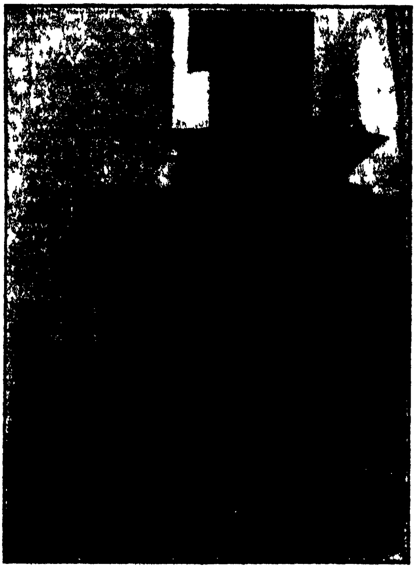

Fig. 1 —Scratcher or Disintegrator.

The mill (Fig. 2) or grater used on the Continent contains wrought iron knives, which first break the apple into pieces. These fall down, and are crushed between two adjustable ribbed stones.

The influence the mill has upon the results obtained is well shown in the following experiment Two lots of apples were ground, one in a Scratcher, one in a Continental mill. and submitted to pressure in the same press and for the same period.

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* This is a subject still needing investigation, as it may be that beneficial yeasts are more easily washed off the apples than are wild yeasts. It is, however, more probable that the latter are most easily washed off, in which case washing would have a new and enhanced value.

The results obtained were: -

1,000 lbs. Apples.	Yield.	
	Juice.	Pressed Pomace.
	lbs	lbs.
Pomace from Scratcher	720	280
Pomace from Continental Mill	650	350

CRUSHING THE PIPS.

The majority of English mills crush the pips, and this is often thought desirable, but it is not supported by the experience of foreign makers nor of many in England. Hence one of the chief characteristics of all foreign mills is that they are so constructed as not to break the pips. Whether they are better than the English mills, and which of the many used in England are good, are questions for future investigation. This is more especially desirable because, when the last trials were held, crushing the pips was considered an essential point in the action of the mill. If in such tests the force expended, the time occupied, the nature of the work done, and the susceptibility of the crushed apples to pressure were recorded—and these could easily be determined by modern appliances in the hands of competent engineers and judges—the results would prove of the utmost value to cider-

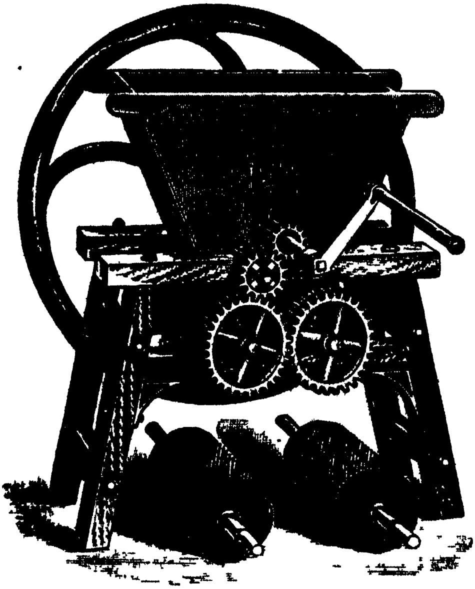

Fig. 2.—Mill or Grater.

makers. In England it was generally considered desirable to crush the pips when grinding the apples, as they were supposed to give a good flavour to the cider. Mr. Harper, however, considers that grinding the apple pips is detrimental to the manufacture and keeping quality of cider. A number of pips were collected by me and analysed. They were found to contain from 37 to 39 per cent. of moisture (water), and when dried had the following composition:—

Composition of Apple Pips (dried at 212 deg. F.).

Oil	18.60
Nitrogenous constituents (albuminoids)	33.12
Carbo-hydrates etc.	26.08
Woody fibre	18.55
Mineral matter	3.65
	100.00

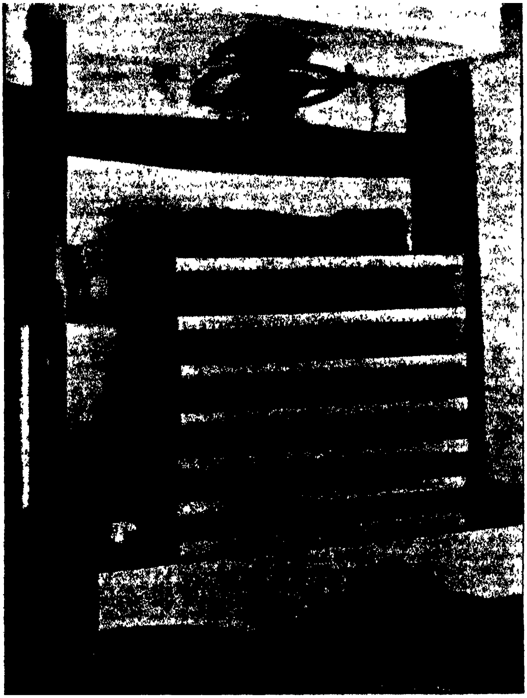

Fig. 3.—Old Style Cider Press.

As the brewer finds too much nitrogenous matter detrimental in brewing it was thought possible that the pips, if ground, might prove detrimental in cider-making. Numerous experiments have therefore been made at Butleigh with apples of the same kind, one cheese being put up with pomace containing crushed apple pips, the other with pomace in which the pips were not crushed. The result has invariably been that a better flavoured cider was obtained when the pips were not crushed or broken. The flavour of the pips is not desirable, and if they are crushed this can at times be detected in the cider, especially if it is dry cider. Hence we now lay it down as one of the rules at Butleigh that the pips must not be crushed. I have also been informed on numerous occasions that cider made from pomace with crushed pips will not clear so easily nor so well as that made from pomace with the pips whole.

PRESSING THE POMACE.

There are many kinds of presses, but any one of the nine or ten varieties commonly used will serve the purpose. The press originally used at Butleigh was one of the old-fashioned type seen in nearly every west-country cider house (Fig. 3). It did its work well, but required a considerable amount of manual labour.

In 1895 a new press was procured (Fig. 4). This was the quadruple gear hand press, shown in the annexed illustration This press obtained the first prise at the trials of cider-making apparatus conducted at Glastonbury in 1890, in connection with the show of the Royal Agricultural Society at Plymouth. The pressure is obtained by means of a mechanical arrangement, by which it is possible either to apply pressure rapidly, or, by a slight alteration of the gear, to obtain greater pressure, though necessarily more slowly. It is claimed for this press that it is capable of exerting a pressure of eighty tons. Whether this be so or not, it has proved an efficient press as compared with that previously used. This will be best seen by a study of the following results of experiments:—

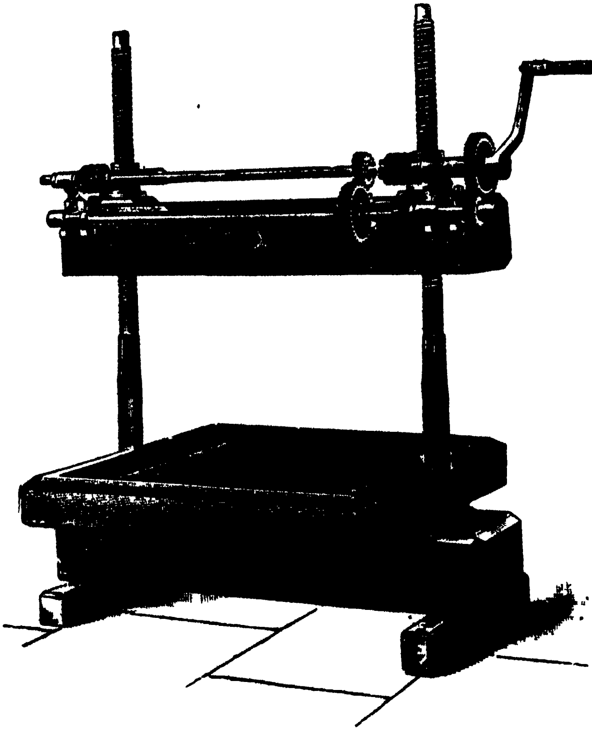

Fig. 4.—Quadruple Handgear Press.

Old Press.

1,000 lbs. Pomace	Juice.	Pressed Pomace.
	lbs	lbs.
In 1894—1st Experiment	693	307
2nd Experiment	743	257

New Press (Workman).

1,000 lbs. Pomace	Juice.	Pressed Pomace.
	lbs	lbs.
In 1895—1st Experiment	706	294
2nd Experiment	720	280

The pomace in each of these experiments was in the press on an average for four hours.

The Continental press (Fig 5) differs from the English press in that the pulp is enclosed in a cage But the most striking difference is in the system adopted for obtaining pressure

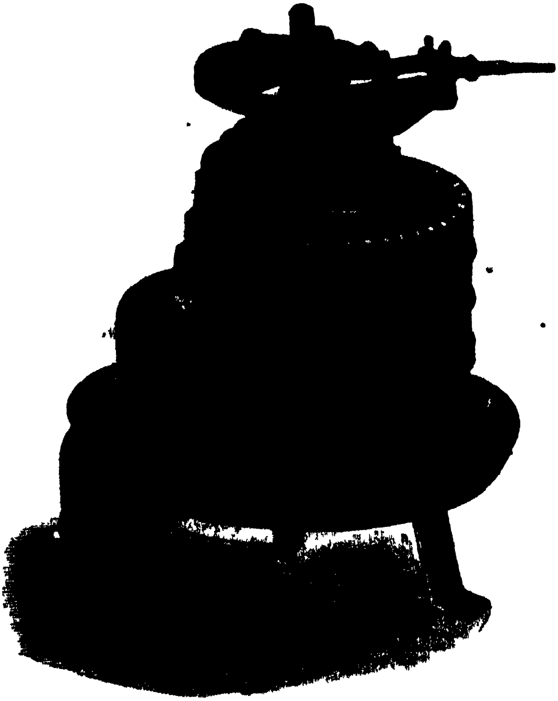

Fig. 5.—Continental Press.

This is done by a double lever mechanism, so arranged that pressure is applied whether the lever be worked backward or forward; the man does not have to walk around the machine, and need scarcely change his position. Hence, the press can be placed in any convenient situation, even in a corner.

Before giving the results of my experiments with the Continental press, it is necessary to state that in the countries where they are used the method of cider-making adopted is different to that hitherto adopted in England. It is of far less importance to the foreign cider-maker, who makes small cider, to obtain the whole of the juice out of the apple at the first pressing than it is to the English cider-maker, who presses as a rule once only. Hence, the Continental press is not made to take out all the juice like our English press. This will be seen from the following results of two experiments.

One thousand pounds of apples yielded from an old English press 307 lb. of pomace and 693 lb. of juice.* The Continental press yielded, from 1,000 lb. of the same apples at the same time, 450 lb. of pomace and 550 lb. of juice. In a second trial, 1,000 lb. of apples yielded in the English press 257 lb. of pomace and 743 lb. of juice, while from 1,000 lb. of the same apples the Continental press gave 438 lb. of pomace and 562 lb of juice. Taking the mean of these results, the English press yielded 718 lb. of juice, the Continental press only 556 lb.

Fig 6.—Showing Cloths in which the Pomace is Wrapped.

It is only right to here state that since these experiments were made there has been considerable improvement in the method of manipulating the Continental press, evidently based on the Butleigh experiments. Also the outer casing has in many instances been done away with, and the cheese made up in the manner adopted at Butleigh, and described later on.

In the case of small makers, where not many hands are available, it is well to have a travelling double-bedded press. The advantage of this is that while one lot of juice is running out, another "cheese" can be put up.

While watching two or three powerful men labouring to obtain sufficient pressure upon the pomace to extract all the juice, the thought arises: Could not this power be obtained far more easily and at less cost by some more simple method? Surely in no other industry where pressure is required is it obtained in so primitive a fashion, and it is impossible to believe that this method will long remain in vogue. The most efficacious method of obtaining pressure is by hydraulic power. Already in large establishments the hydraulic press is used, but unfortunately its high price prevents it for the present becoming more generally employed.

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* This may easily be converted into gallons, the average weight of one gallon of apple juice being 10¼ lb.

Extracting the Juice.

The ground apples are termed pomace, probably from the French words Pommes Macérées. To extract the juice from this pomace it has to be subjected to pressure. The old system, still in vogue in many parts of Somerset, was to build up on the table of the press a mass of pomace mixed with straw "reed" to hold it together during the period of pressure. The mixture of pomace and straw is called a "cheese. The straw does not sufficiently bind the pomace to enable it to be properly pressed by one application of the press. Pressure has therefore to be taken off after some time; the edges of the cheese are then trimmed with a knife, the trimmings placed upon the top of the cheese, and the whole re-submitted to further pressure. This process is sometimes repeated. The time and trouble involved were great, and it was determined to improve upon this method. The pomace was wrapped in thick Manilla cloths (Fig. 6), and between these cloths gratings of wood (Fig. 7) were interposed to keep the cloths in position and to secure uniform pressure upon the mass. These thick Manilla cloths are expensive, difficult to wash, and more difficult to keep clean; they involve a large amount of labour, which it was desirable if possible to avoid. After many experiments it was found that there was no need for such a substantial texture to be used, and thin cloths were introduced in their place. These cloths consist of what is known as netting shading. It is inexpensive to buy, easy to manipulate, and also to wash. The cloths are infinitely better than straw, and once they have been used no one would wish to go back to the old system of reeds. It was doubted whether the thin cloths would withstand the pressure necessary to extract the juice, but they have been found to do this. A new cloth of deficient strength

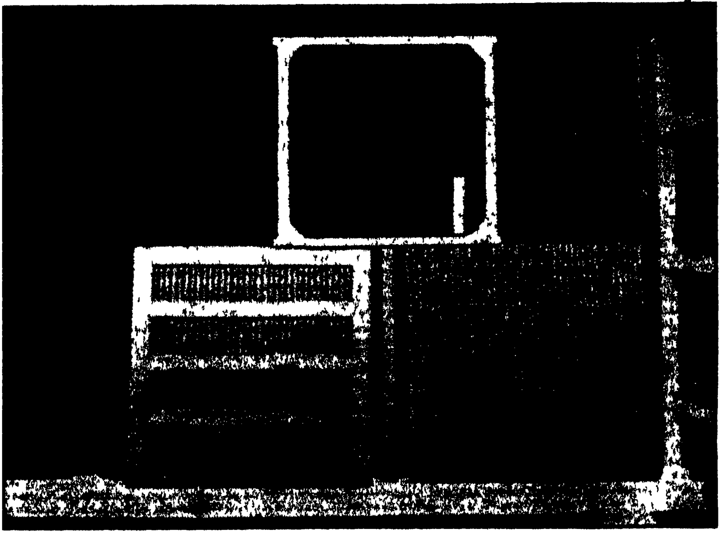

Fig. 7.- Wooden Gratings.

it some part may burst, but if the cloth will withstand the pressure the first time it is used there is little fear of its subsequently breaking. The tannin in the apple juice seems to tan the cloth and increases its strength. An experiment made to determine whether the pomace were as well pressed in the thin cloths as in the thick Manilla cloths gave the following results:—

Moisture in pomace from—

Thin cloths	75.0 per cent.
Thick cloths	74.5 per cent.

An experiment had previously been made to determine whether the thick cloths prevented the juice being extracted from the pomace as thoroughly as by the old reed system. The results of these experiments were as follows:— Average amount of water left in pomace as determined by analysis:—

From a reed cheese	72.1 per cent.
From a Manilla cloth	72.7 per cent.

is thus seen that the juice can be extracted from the pomace by using thin cloths as efficiently as by using thick cloths or by the reed system, and this result is obtained with one application of pressure, in lieu of two or three, and therefore with a considerable saving of both time and labour.

Several questions arise as to the treatment of the pomace. The first is: Should it be pressed immediately after it is ground, or should it be allowed to stand some time before pressure is applied? Experiments made on this subject have proved that the colour of the juice from pomace pressed immediately after grinding is lighter than the juice from pomace which has been allowed to stand. This is only what might be expected, for, as is well known, if broken apples be exposed to the light and air, they soon become discoloured. It is commonly believed in the West of England that unless cider has a deep colour it is deficient in body or strength. I am not in favour of a dark-coloured cider, nor do I think the public likes deep-coloured drinks. The tendency for years past with beer and wine has been to lighten the colour. At the same time there are some parts of England where the cider is naturally very pale in colour, too pale, in fact, and in such districts it may be desirable to expose the pomace to the air before grinding so as to augment the colour.

The quantity of juice obtained from pomace which has been allowed to stand after grinding is not greater than from pomace which is pressed at once. The following experiment proves this fact:—

Two lots, each of 1,000 lb. of apples, were ground, the first lot being pressed immediately and the second after twenty-four hours. The following results were obtained:—

——	Weight of Apples.	Weight of Pressed Pomace.	Weight of Juice.
	lbs.	lbs.	lbs.
Pressed at once	1,000	294	706
Pressed after standing 24 hours.	1,000	280	720

The difference in quantity is only such as might occur between any two cheeses.

The results of the analyses of the juice from these experiments are as follows:—

Analyses of Juice.

——	Sp. Gr.	Acid.	Sugar.	Tannin.	Total Solids.
1. Pressed as soon as ground...	1·0539	·43	11·36	·30	13·02
2. Pressed 24 hours after grinding	1·0533	·44	11·11	·17	12·80

A second experiment yielded the following results:—

——	Sp. Gr.	Acid.	Sugar.	Tannin.	Total Solids.
1. Pressed as soon as ground..	1·050	·36	10·87	·29	11·98
2. Pressed 24 hours after grinding	1·051	·41	10·87	·24	12·40

The variations being slight, indicate that no considerable chemical change is produced by keeping, except a similar change to that which occurs when the apples are allowed to rot, namely, that some of the tannin appears to be precipitated, and not to enter the juice. Now, as the presence of tannin is considered necessary, not only as a means of keeping the juice, but of obtaining it clear and bright, it would seem that, if regarded only from this point of view, it is best to press the pomace as soon after grinding as possible. When this juice was fully fermented and ripened, it was found that the cider made by pressing the pomace as soon as it was ground was far superior to that made from the pomace which had stood twenty-four hours before being pressed.

UTILISING THE ONCE PRESSED POMACE.

The pressed pomace as taken from the press has been analysed by me and found to have the following composition:—

Composition of Pressed Apple Pomace.

Water	72.40
Oil	1.08
Nitrogenous constituents	1.27
Sugar, etc.	18.34
Woody fibre	4.64
Mineral matter	2.27
	100.00

Thus the pomace as it comes from the press, however dry it may appear to the eye or touch, really contains a large quantity of liquid. In three determinations of separate cheeses there were found 72 per cent., 75 per cent., and 74 per cent. of moisture respectively. The question arises how can this pomace be further utilised? The expressed pomace may be used for feeding animals, and is a good food so long as it can be given to them while still fresh. But it undergoes rapid change, and is then said to be injurious.

It has been suggested that the pomace should be extracted with water and the solution used for making vinegar. But although this can be done, it is not desirable to do it unless the whole process of vinegar-making can be kept away from the cider-making. One of the worst troubles of the cider-maker is due to the introduction into the cider house of the ferment which produces vinegar, technically known as the *Mycoderma aceti*; there is far too much of the nature of vinegar about some of the cider made at the present day, and one of the chief objects of these experiments has been to show how to avoid the presence of an excess of acid in the cider.

However, the fact that the once-pressed pomace contained as much as 18 per cent. of sugar, etc., led me to think that something might be done to extract this sugar.

Experiments were made in various ways:—1st. An experiment was made to determine whether, by breaking down the cheese and re-pressing, sufficient juice could be obtained to justify the trouble. From 1,850 lb. of pomace 1,277 lb. of juice of specific gravity 1.57 were obtained in the first pressing. After being broken down and re-pressed, the cheese yielded a further 187 lb. of juice of specific gravity 1.054. It will be noted that the second juice had not so high a gravity as the first. It would thus appear that the quantity and quality of the juice so extracted was not worth the necessary time and labour.

A second method investigated was to try and wash out some of the juice with water. This method is largely adopted abroad. There two varieties of cider are made both from the same lot of apples. The apple pulp is placed in the press and the juice extracted and measured, and when fermented constitutes pure cider. The pressed pulp or pomace is then taken out of the press, broken up fine, or reground, and placed in a vat with water. The mixture is stirred up from time to time, left for from twelve to fifteen hours, and then put into the press and subjected to pressure. This second juice is sometimes added to the first juice, sometimes kept separate. In the latter case some sugar is added, and the fermented liquid is called small cider. Numerous experiments have been made on this method of treating the pomace, and are subsequently described under the heading "small cider."

(To be continued.)

THE FARM HOME BOOKSHELF.

By J. D. Towar, Principal Agricultural College

Some time ago the officers of the Department of Agriculture were asked by the Council of Agriculture to prepare a list of books suitable for an agricultural library. That list has been prepared; but it is too long for the ordinary farmer's library, and it contains the titles of a number of books which have been recommended for a general library only. From enquiries received from time to time, it is evident that there is a demand for a short list of books which might serve as text books for home study of agriculture and the agricultural sciences.

To meet a demand of this nature, Prof. L. H. Bailey, of Cornell University, undertook a few years ago, with the aid of the best agricultural and horticultural experts in the United States, to edit a series of plainly written books, which has been published by MacMillan & Co., of London and New York, and is known as the "Rural Science Series." The more popular of this list are "The Principles of Agriculture," by Bailey; "The Soil," by King; "The Fertility of the Land," by Roberts; "Milk, and its Products," by Wing; "Fertilisers," by Voorhees, and "Irrigation and Drainage," by King.

There are still other very valuable books in the series, but should they all be given the object of this article would at once be defeated, as I wish to give a short list of the best books only which I can recommend as especially desirable for the farm home bookshelf. The above half-dozen books are all good, and, in my opinion, may be listed in the order named as the best American books for the Australian student of agriculture to study. These books are written in the popular style, and require no particular scientific knowledge to be thoroughly understood.

For those wishing a plainly written book on agricultural chemistry, Professor Harry Snyder, of the University of Minnesota, has written recently a treatise on "The Chemistry of Plant and Animal Life," published by Macmillan & Co., which is sure to satisfy a long-felt want. Professor Snyder's experience in teaching classes in the Minnesota School of Agriculture has evidently given him the idea of just what to teach the farmer of this important science, and taught him the right way to express himself in order to be thoroughly understood. In the preface he says:—"The class of students to whom this instruction has been given have been mostly earnest workers who attended school largely from personal choice who desired to make as much progress as possible Numerous questions have been asked by them relating to the application of chemistry to farm and everyday life and for a number of years the author kept a question box, in which were placed the more important questions asked in class, and the difficulties experienced in laboratory work, and in developing the work from year to year these questions and difficulties have been considered " "It has been the aim throughout to present the topics in such a way that they would be easily understood, and to develop the reasoning powers of the student so that he would be able to make the best use of his chemistry in everyday life affairs " He devotes a chapter to "Composition of Matter," another to the Properties of Elements and Compounds," and another to "Laboratory Manipulation " Following these the more important chemical elements and their compounds are considered and treated in the plain language of the common school textbook The "Chemistry of Plant Growth " the composition and relative feeding value of the various grains, feeds and fodders are carefully discussed There are chapters on "Fermentation," "Chemistry of Digestion and Nutrition,' "Feeding of Animals " and the book concludes with a chapter on 'The Rational Feeding of Men '

Any of the booksellers handling Macmillan & Co s books will have it or can procure copies, and the price of this as well as of the other books referred to is not excessive

HORSE COMPLAINT ON YORKE'S PENINSULA.

Mr J Desmond M R C V S Government Veterinary Surgeon, has furnished the following report on complaint causing deaths of horses near Minlaton —

Sir I have the honour herewith to submit a report on an outbreak of disease in horses on Yorke's Peninsula On Thursday April 7, I arrived at Mr Russ s farm at Minlaton at 5 p m , to find that four horses had succumbed and the fifth was *in extremis* I examined the latter animal, and recorded the following notes —Draught mare four years old in prime condition Taken bad at midnight on the 4th presenting the following appearances, as described by the owner's son in his own words Stiff in the legs, appearing to drag the hind legs outwards (laterally) Would eat as usual Loose in the paddock near the house Next morning at 7 a m she was lying down near the house We tried to get her up she struggled very much, and after a short interval we were successful in getting her on to her legs She went into the yard and fed with the other horses About 8 30 a m she lay down near the stable At 10 a m she was standing at the water trough about 100 yards from the stable She stopped at the water trough till 1 30 p m , and was then driven up to the stable On arrival at the stable she was fed on chaff and bran, and lay down for half an hour, then got up and had a small feed, and lay down at 5 p m , struggled for about two hours, and could not get up Saw her every hour during Tuesday night she was lying down and not struggling On Wednesday, the 6th, at 10 a m , she struggled very much and could not get up At 2 p m. froth was escaping from her mouth Passed dung at 3 p m , and at 6 p m struggled very much Saw her every two hours on Wednesday night, she was struggling very much up to 8 a m on Thursday morning Got quieter after 8 a m , but had a bad look about her eyes, and remained in much the same condition up to 5 p m ' Physical examination—Pulse, 140 (normal 36-40) very weak respirations, 34 (normal 14), temperature, 103 7 (normal 100 5) Mucous membranes highly injected and covered with petechial spots Rectum contained normal faeces urine escaping. Sweating over floor of the abdomen *In extremis* Would not live more than three hours History of horse that died at 11 a m on the 7th Draught mare, eight years old, prime condition, bred on the farm Took bad on Tuesday, the 5th, at 8 a m , presenting the same appearances as the mare now ill *Post-mortem* examination —Lungs, same appearance as that found in the Port Pirie horse disease Stomach full of food and water Contained four parasitic tumours, in which the worm Sclerostoma tetracanthum was found in large numbers Bowels—Colon, inner surface covered with blood and contained thousands of mature and embryo worms of the order Strongylus armatus Diaphragm showed signs of great abdominal pressure. A parasitic aneurism of the mesenteric artery was found, and, when dissected, living worms (Strongylus armatus) were found. Heart, liver, and kidneys were healthy. Bladder empty, no signs of poisoning. Mare alive on arrival, died at 8 p.m. Friday, April 8, 8.30 a.m., made *post-mortem* examination of mare that died at 8 p.m. on the 7th. Heart healthy. Lungs identical with the horses that died in the Port Pirie outbreak. Diaphragm showed signs of pressure on the abdominal side. Stomach contained food and water and numerous large worms (Ascaris megalocephala), and parasitic tumours containing the worm Sclerostoma tetracanthum. Small intestines contained the worm Ascaris megalocephala and the tapeworm Taenia mammilana in large numbers. Caecum contained partly digested Ascaris megalocephala, ingesta, and water. Bowels.—Colon very inflamed, contained blood and worms (Strongylus armatus), matured and immatured, in thousands. Mesenteric artery contained a parasitic aneurism with living worms. Examined a draught horse, five years old, that died at 2 a.m. on Wednesday, the 6th. Too much decomposed to make a complete *post-mortem* examination. An aneurism of mesenteric artery was found. The two other horses were too decomposed to make a *post-mortem* examination. Five horses in prime condition, and valued at £50 each, died during the week on this farm.

"As the trouble was caused by internal parasites, I decided to put all the remaining horses on this farm under a course of medical treatment to expel the worms from their bowels. Dr. Hart, of Minlaton, who was interested in the cases, and helped me to make the *post-mortem* examinations, volunteered to get suitable medicines, as there was no chemist nearer than 20 miles. I explained the line of treatment to Dr. Hart, and he telegraphed to Adelaide for the medicines, and they arrived at Minlaton on Saturday evening, the 9th. All the horses on Mr. Russ's farm were placed under treatment, and in two days were passing dead worms from their bowels in large numbers.

"The following are the particulars of the treatment adopted:—Santonine, 20 grains; tartar emetic, 60 grains; to make one powder. One powder to be given in the feed night and morning; each horse to get 20 powders.

"I advised Mr. Russ to provide salt and sulphate of iron in the proportions:—One of sulphate of iron (copperas) to 19 parts of salt, to be well mixed and placed in a trough protected from the rain and easy of access to all his farm animals. As all the water on this farm used for the animals is surface water, collected in dams, I decided to treat the water supply medicinally, and advised the addition of sulphate of iron in quantities sufficient to make the water appear red.

"I examined a large number of horses on adjoining farms, and found that they were affected with internal parasites, and advised the owners to treat their animals by the above-mentioned methods. On returning home I visited Yorketown. There I found several farmers' horses also affected with internal parasites, and explained to them the treatment I advised for the horses affected in the Minlaton district. When the opportunity arrives I will go into this matter more fully, giving a full description (with drawings) of the parasites. Up to the present these parasites have caused the deaths of horses in this State valued at £1,100, *i.e.*, Port Pirie horse disease, £250; Hawker horse disease, £600; Yorke's Peninsula horse disease, £250."

ROSEWORTHY AGRICULTURAL COLLEGE NOTES.

FARM.

By J. D. TOWAR, PRINCIPAL AGRICULTURAL COLLEGE.

On the farm seeding operations began on April 11 in Ebsary's B with oats, both broadcast and with the drill, on ground on which phosphate was drilled some three weeks' previous. Barley seeding was done on April 20 to 23, and a few acres of Majestic wheat were sown on April 15. A soaking rain of 1.37 inches on April 18 supplied ideal moisture conditions for continuing the seeding. About 500 acres will go into crop this year. There will be about 37 acres of barley, 65 acres of oats, and nearly 400 acres of wheat. A few varieties of oats and barley are being grown, and a large number of varieties of wheat will be tried. Mr. R. Marshall has kindly supplied us with a number of varieties of his wheats, which will be tried in a small way; while from Mr. W. Farrer and others we have small samples for trial and experiment.

Kale.—Reference has frequenly been made to this plant during the past year; but it is still interesting to note that the sowing of last May is still alive, and growing thriftily. Rape sown at the same time has long since matured its seeds and died.

Lambing.—The season this year is two weeks earlier than last. The rams were turned with the ewes on November 18, and on April 15 five lambs had made their appearance. There were two Shropshires, two Southdowns, and one Merino. In former years the Dorsets were the first to appear. The lambs are fairly strong and active, but the ewes, though fat, do not seem healthy, and are giving a poor supply of milk. A few have sickened and died. the trouble appearing like impaction of the third stomach, dry murrain, or grass staggers—the symptoms being identical with those of two years ago, when over 10 per cent. of the flock was taken.

DEPARTMENTAL NOTES AND WORK.

During April Mr. Quinn has visited Tasmania and portions of Victoria for the purpose of noting the progress of fruitgrowing in those States. He will report officially upon any points of interest which may prove of value to our growers. At the large fruit show held in Hobart the exhibit of apples, pears, and grapes brought from South Australia by Mr. Quinn elicited many favourable comments from the interstate visitors. Their fine colour and good carrying powers were especially remarked upon by the Tasmanian growers.

During April the Inspectors under the Vine, Fruit, and Vegetable Protection Act have passed 14,497 cases of fruits for export to interstate and European markets. These figures only represent the fruits sent to Queensland, Victoria, and New South Wales, where certificates of freedom from diseases are demanded, and the apples shipped to London by several exporters, for whom the officers of this Department act as umpires on the wharf. Of the above total, upwards of 6,000 cases were of grapes shipped to Queensland or sent by rail to Sydney. Within the same period 2,327 packages of vegetables were passed for New South Wales, and 35 parcels of plants for various States of the Commonwealth.

The importations during April amounted to 1,421 cases of fruits of a tropical nature, and 57 parcels of plants, chiefly of bulbous kinds. Of these 11 have been detained or destroyed owing to the absence of the necessary declaration *re* their origin.

The first session of the College year commenced on April 20, after seven weeks' holidays A total of 35 students has been enrolled, there bein 7 in the third year class, 13 in the second year, 14 in the first year, and 1 special student. During the vacation the College dormitories have been thoroughly cleaned, and necessary improvements effected.

On April 25 several members of the College Committee of the Council of Agriculture visited the College and witnessed a trial of the two wheat-grading machines purchased by the Department. A report of this visit appears elsewhere.

On April 16 the Committee of the Royal Agricultural and Horticultural Society visited the College to select a site for pens for the proposed egg-laying competition. They decided to locate the fowls in the carob plantation near the Principal's house. This should prove an ideal spot, being well drained and sheltered from the winds, while it will be possible to so arrange the yards that there will be natural shade in each for the fowls.

On March 28 the Principal of the College addressed a meeting of the Virginia Branch of the Agricultural Bureau, and on March 31 a meeting at Ardrossan.

During April the Inspector of Fertilisers visited Strathalbyn for the purpose of selecting a site for experimental pots on the farm of Mr. P. A. Cockburn. Similar experimental plots have been selected at Saddleworth and Aldinga, and it is proposed to keep these plots going for several years in order to test the results of the continuous application of manures on the same land. Mr. Summers also visited Wallaroo, Freeling, and Port Adelaide to obtain samples of fertilisers for analyses, and in company with members of the Council of Agriculture was present at the trial of wheat-graders at Roseworthy College.

COUNCIL OF AGRICULTURE.

The monthly meeting of the Council of Agriculture was held on Wednesday, April 13, there being present the Chairman (Mr. R. Caldwell), Col. Rowell, C.B., and Messrs. G. R. Laffer, R. Marshall, T. E. Yelland, B. Basedow, H. V. Pridmore, John Miller, A. Molineux, Thomas Hardy, A. M. Dawkins, and F. Krichauff.

The Hon. Minister of Agriculture forwarded intimation from the School of Mines that the small flour-treating mill had been erected, and was now ready for work. On the motion of Mr. Marshall it was resolved that the School of Mines authorities be asked under what conditions they were prepared to undertake tests of the flour-making qualities of various wheats.

The Secretary reported that applications, to be received up to June 1, had been invited for the position of Dairy Instructor, at a salary of £200 and allowance equal to £50.

A letter was received from Dr. Ramsay Smith intimating that the reports on cattle complaints forwarded to him some months since contain information of the greatest value, and appear to go a long way to casting light on both the nature of the disease and the problem of where to look for a remedy. Members expressed the hope that Dr. Smith's report on the subject would be available at next meeting.

Some discussion took place on Professor Towar's report, as published in the April issue. Mr. Dawkins did not consider the unweighted pit of ensilage satisfactory. The material had shrunk considerably from the sides of the pit, and there was considerable waste of material. Mr. Krichauff thought the Council should be informed of the cause for so many students missing the examinations. A few months ago they were advised that 52 students were in residence, but only 41 were in attendance at the close of the sessions. On the motion of Mr. Dawkins, it was decided that the College Committee visit the College during the month, and that the Principal be asked to arrange for test of the two grain-graders on that occasion.

The Bureau Committee reported that Wilmington Branch had communicated with all Branches in respect to the suggested rule that one-third of the members should retire each year, being, of course, eligible for re-election. The members of the committee agreed that the introduction of new blood was essential, and if the proposal met with the approval of most of the Branches they would recommend the Council to make it compulsory on all Branches, instead of being merely optional, as at present. It was decided that the Branches be asked to consider the Wilmington circular at an early date.

On the recommendation of the Bureau Committee the following nominations were approved:—Messrs. R. Bierwirth, C. T. Rattew, Nantawarra; W. Buchanan, A. Sharman, M. L. McCormack, Bute; P. Baker, Virginia; J. C. Carroll, Reeve's Plains; James Spillane, Balaklava; H. H. Hilders, Richman's Creek; W. Graham, H. K. Moore, Caltowie; [illegible] D. Travers, L. Nourse, H. Pomeroy, Petersburg; H. Humphris, Stansbury; Henry Welch, Port Elliot; John Jennings, George Jennings, J. Mou[illegible], jun., Norton's Summit; W. J. White, Madigan, Golden Grove; Joel Williams, F. Smart, Inkerman; W. J. Brinkworth, Appila Yarrowie; and R. Thiele, Kanmantoo.

Mr. Laffer reported on visit to Mylor Typical Orchard by members of the Horticultural and Viticultural Committee on March 8. The property consists of over 100 acres of land, 20 acres of which are planted with fruit trees Besides over 1,400 varieties of apples and about 1,100 of pears, there are many hundreds of varieties of other trees and various kinds of bush fruits. The careful manner in which the trees had been arranged, and the method adopted to keep the records of the varieties, were highly commended Generally the trees had made excellent growth, though, owing to the characteristics of the different varieties and the stocks upon which they were worked, the growth was naturally uneven. The oldest portion of the orchard had now been planted five years, and this season 140 varieties of apples and 24 of pears had fruited. In order to get the best value out of the expenditure on the orchard each variety as it comes into bearing should be thoroughly tested to determine its qualities. Especially in regard to apples and pears, of which there was a magnificent collection, should they benefit. They wanted some varieties of apples fit to export that would come in a week or ten days earlier than those now grown. With pears, they had a splendid market in Europe, but upon no subject did the growers require more definite information than on the question of the best varieties of pears to plant. Unfortunately, nearly every kind now grown here that would keep long enough had one or more objectionable qualities, such as poor bearing, irregular ripening, deficient quality, uneven shape, etc. He felt, however, that in the collection at Mylor there must be some kinds that would be more suitable for export than those usually grown here. The same applied to other classes of fruit. He considered that Mr. Holtze had every reason to be proud of the work he had done at Mylor, and believed he would welcome the assistance of commercial growers in determining the value of the respective varieties. After some discussion, on the motion of Mr. Laffer it was resolved that the report be forwarded to the Hon. Minister, with a suggestion that he should ask Mr. Holtze whether he would welcome the assistance of a small committee of fruitgrowers in determining the commercial value of the respective varieties of fruits.

Mr. Hardy referred to the starling nuisance. The evil was becoming more serious every year, and it was scarcely possible to estimate the damage to the grapes caused by the birds. Fruitgrowers would probably suffer severely from the depredations of starlings. United action was necessary in dealing with the birds, which roosted in immense numbers in certain trees He was prepared to contribute towards a fund from which to offer a substantial reward for a practicable scheme for dealing with the birds. Mr. Pridmore supported Mr. Hardy's remarks. The damage done to the grape crop alone must amount to many thousands of pounds, and he was sure there would be no difficulty in raising at least £100 amongst the vinegrowers as a reward for a remedy. Several members mentioned serious damage to fruit and grain crops by the starlings.

On the motion of Mr. Yelland, it was decided that the Council recommend to the Hon. Minister that every assistance be afforded the committee of the Royal Agricultural Society if the second year's egg-laying competition is carried out at Roseworthy.

Mr. Pridmore thought it would be well if the coloured illustrations of weeds which have appeared in *The Journal* were republished and sold at a low price. The Secretary stated that it was intended to do this when one or two more illustrations were completed.

FARM AND DAIRY PRODUCE MARKETS REVIEW.

Messrs. A. W. Sandford & Co. report on May 1, 1904:—

In a country like South Australia, where so much depends upon the rainfall, it is little wonder that the weather is closely watched, so that anything approaching dry conditions becomes a leading topic. In our former, reference was made to the entire absence of rain during March. This continued right into the middle of April, when a splendid downpour set in, the area of the fall being widespread, nearly each of the agricultural districts classing it as very opportune and useful. At all events, the month terminates showing a rainfall above the average. Farmers meanwhile are taking advantage of the promising outlook and are now busy seeding.

In Commerce there is an absence of anything like activity, the purchases made being very much of a hand-to-mouth character. This is attributable to the shortness of money, many farmers still holding on to their wheat, for there must be large quantities yet to market, when it is taken into consideration that the yield of the late harvest was the heaviest for fourteen years. Most of the mines at Broken Hill are doing good work, favourable reports coming to hand, which are borne out by the dividends that are being declared. In Metals, with only some slight fluctuations, since our last, Silver and Lead are just about even with former quotations, excepting that Copper shows a further hardening.

Breadstuffs.—During the slight re-action in the European markets, wheat was sold in our three southern States in considerable quantities, at 3/1 to 3s. 1½d., the largest parcels being placed in Victoria. U.K. cargoes have since declined under the influence of the depression in the Home Markets, the last sale of Australian Wheat being at 28s. 6d. per quarter of 480 lb. The reasons given for the decline are favourable weather throughout Europe, and large offerings from Argentine, India, and Russia. Farmers here are busy sowing, and very little wheat is finding its way to market, but there are no anxious buyers at present quotations. The value of wheat in Melbourne, Sydney, and Adelaide is on a par. Flour has seen little business during the month, but shipments continue to be made to England, where the price offered will nett about £7 5s. f.o.b. here. Offal is firmer in the eastern States, and there has been a fair demand from Western Australia at about 7d. f.o.b. for Bran. Locally not much business has been done, though re-sellers have accepted prices somewhat under millers' quotations. In Forage lines the sales have only been for local consumption, and owing to late wet season damaging a quantity of hay South Australian chaff is not just now in favour, therefore the shipping quotation is only nominal. Feeding Grains.—There is no change to report in Oats. Cape Barley experienced a bit of a spurt owing to the parcels required to complete a cargo for Africa, but as this has now been filled, prices have come back again.

Growers of Potatoes have had to face the lowest selling values for many years, the quantity being heavy, and, as the quality of the local grown is exceptionally good this season, this has enabled them to hold the Adelaide market, so that Mount Gambier growers have become alarmed, and with scarcely any city and no export sales, are now offering at such low rates as must leave very little, if anything, to the owners after paying for digging, bagging, and cartage. Onions.—In this line values have remained almost stationary, the "locals" filling Adelaide requirements, therefore Mount Gambier is forced to look to the country and export for an outlet.

Dairy Produce.—The sultry weather that prevailed during quite the first half of April affected the keeping qualities of most of the butters coming forward, but as the excellent rain on the 19th of the month brought along cooler and more favourable conditions, a decided improvement was at once apparent in the qualities. This caused a strong demand to be experienced for all fresh in prints, and, whilst rates were disposed to harden, any substantial rise was precluded owing to the lower quotations and shipments of Bulk Butter being landed from the eastern States. Therefore, whilst Victoria and New South Wales have such an exportable surplus, we fear there is very little chance of any further improvement in price for the local product. Eggs.—In spite of lower rates ruling in Victoria, our market has continued to steadily harden, until almost record prices were touched compared with corresponding months of previous years, the advance being 6d. per dozen on last quotations. Cheese.—The quality is keeping quite up to usual standard, which has all helped to popularise the demand for South Australian makes, therefore very excellent clearances are being effected, and, although values have sustained, there is yet no advance in price. Bacon.—With regular buying orders for Broken Hill and Western Australia, factory-cured sides have had a good month's business, and prices show a firming of about ½d. per ℔. Hams have been rather slow, but values remain unaltered. Honey continues dull of sale, both for local and export trade, but Almonds are in good request, several fair-sized shipping parcels having been disposed of.

Carcase Meat.—The first of the winter sales was started in April, and very satisfactory rates were realised for all prime carcases of Pork and Veal the buyers at Fridays' markets operating freely for their Saturday requirements.

Live Poultry.—An excellent market exists for all pens of prime, well conditioned birds, and for these good prices were secured; but there is again a tendency to forward poor and light sorts, which only bring down the average of rates realised

Market Quotations of the Day.

Wheat.—At Port Adelaide, shipping parcels, new, 2/10 to 2/11 per bushel 60 ℔.

Flour.—City brands, £7 10/ to £7 15/ ; country, £6 15/- to £7.

Bran.—7d. to 7½d. **Pollard.**—8d. to 8½d. per bushel of 20 ℔.

Oats.—Local Algerian and Dun, 1/5 to 1/6½ ; White Champions, 1/8 to 1/10 per bushel 40 ℔.

Barley.—Malting, 2/6 to 3/ , Cape, 1/9 up to 1/11 per bushel 50 ℔.

Chaff.—£2 12/6, nominal, per ton of 2,240 ℔., bags in, f.o.b. Port Adelaide.

Potatoes.—New locals, £2 5/- to £2 10/ ; Gambiers, £2 5/- per 2,240 ℔., f.o.b. Port Adelaide.

Onions.—New locals and Gambiers, £3 per 2,240 ℔.

Butter.—Factory, creamery, and choice separators, 11d. to 1/ ; best dairies and fair separators, 10d. to 11d.; well-graded store and ordinary dairies, 8d. to 9d., stale lots, 7½d. to 8d.; Victorian bulk, 8½d. to 9½d., fair to choice.

Cheese.—Factory make, 4½d. to 5½d. per ℔.

Bacon.—Factory-cured sides, 8d. to 8½d.; farm flitches, 6½d. to 7d. per ℔.

Hams.—S.A. factory, 9½d. to 10d. per ℔.

Eggs.—Loose, 1/7½ ; in casks, f.o.b., 1/9½ per dozen.

Lard.—In bladders, 5½d.; tins, 4½d. to 5d. per ℔.

Honey.—2½d. prime clear extracted, in 60-℔. tins; Beeswax, 1/1 ℔.

Almonds.—Softshells, 4d. to 4½d.; kernels, 8½d. per ℔.

Carcase Meat.—Bright, handy weight shop porkers, 4½d. to 5d.; choppers and heavy weights, 3½d. to 4½d ; prime veal, 3d. to 3½d.; fair stuff, 2½d. to 3d.

Live Poultry.—Good roosters, 1/9 to 2/2 each; plump hens and fair-conditioned cockerels, 1/2 to 1/8; ordinary hens, from 11d. to 1/1; poor and light, 7d. to 9d.; ducks, 1/6 to 2/3; geese, 3/- to 4/ ; pigeons, 6d.; turkeys, 4d. to 6½d. per ℔., live weight, for fattening to fair table sorts.

Above quotations, unless when otherwise specified, are duty paid values on imported lines. Grain, Flour, and Forage for export are f.o.b. prices at Port Adelaide. Dairy products are City Auction Mart rates. In Grain, Chaff and Potatoes sacks are included, but weighed as produce. Packages free with bulk Butter and Cheese.

MONTHLY RAINFALL.

The following table shows the rainfall for the month of April, 1904 :—

Adelaide	2·01	Manoora	0·99	Echunga	3·31
Hawker	0·68	Hoyleton	0·82	Macclesfield	3·09
Cradock	0·39	Balaklava	1·13	Meadows	3·30
Wilson	0·52	Port Wakefield	1·37	Strathalbyn	1·38
Gordon	0·42	Saddleworth	0·84	Callington	0·73
Quorn	0·37	Marrabel	1·16	Langhorne's Bridge	0·90
Port Augusta	0·58	Riverton	1·14	Milang	1·80
Port Germein	1·16	Tarlee	0·88	Wallaroo	1·41
Port Pirie	1·40	Stockport	1·17	Kadina	1·93
Crystal Brook	1·22	Hamley Bridge	1·31	Moonta	1·99
Port Broughton	1·13	Kapunda	1·35	Green's Plains	1·67
Bute	1·50	Freeling	1·32	Maitland	1·30
Hammond	0·57	Stockwell	1·03	Ardrossan	1·71
Bruce	0·37	Nuriootpa	1·22	Port Victoria	1·25
Wilmington	0·87	Angaston	1·33	Curramulka	1·25
Melrose	1·24	Tanunda	1·48	Minlaton	1·23
Booleroo Centre	1·19	Lyndoch	1·84	Stansbury	1·69
Wirrabara	1·07	Mallala	1·09	Warooka	1·97
Appila	0·87	Roseworthy	1·30	Yorketown	1·79
Laura	0·95	Gawler	1·49	Edithburg	1·17
Caltowie	0·73	Smithfield	1·37	Fowler's Bay	1·40
Jamestown	0·77	Two Wells	0·99	Streaky Bay	0·58
Gladstone	0·82	Virginia	1·13	Port Elliston	1·10
Georgetown	1·12	Salisbury	1·22	Port Lincoln	1·59
Narridy	1·44	Tea Tree Gully	1·56	Cowell	0·90
Redhill	1·15	Magill	2·48	Queenscliffe	1·04
Koolunga	0·89	Mitcham	2·26	Port Elliot	2·01
Carrieton	0·37	Crafers	3·14	Goolwa	1·87
Eurelia	0·29	Clarendon	3·82	Meningie	1·69
Johnsburg	0·13	Morphett Vale	2·56	Kingston	1·38
Orroroo	0·22	Noarlunga	2·18	Robe	1·65
Black Rock	0·47	Willunga	2·39	Beachport	1·55
Petersburg	0·34	Aldinga	2·03	Coonalpyn	1·40
Yongala	0·57	Normanville	1·77	Bordertown	1·14
Terowie	0·32	Yankalilla	1·82	Frances	1·24
Yaroowie	0·40	Eudunda	0·73	Naracoorte	1·41
Hallett	0·69	Truro	1·02	Lucindale	1·45
Mt. Bryan	0·74	Palmer	0·45	Penola	1·46
Burra	0·78	Mount Pleasant	1·12	Millicent	1·78
Snowtown	0·74	Blumberg	1·39	Mount Gambier	1·55
Brinkworth	0·72	Gumeracha	1·56	Wellington	1·32
Blyth	0·73	Lobethal	1·83	Murray Bridge	0·86
Clare	1·31	Woodside	2·44	Mannum	0·98
Mintaro Central	1·12	Hahndorf	2·12	Morgan	0·21
Watervale	1·44	Nairne	2·42	Overland Corner	0·42
Auburn	1·02	Mount Barker	3·32	Renmark	0·28

ANALYSES OF FERTILISERS.

By W. L. Summers, Inspector of Fertilisers.

The following results of analyses of samples of fertilisers obtained by myself during the past four months are published for general information. In each case the certificate of constituents, or guarantee registered by the vendor, is shown in brackets, thus (36 per cent.), immediately before the results of the analyses. As additional samples are obtained and tested the results will appear in *The Journal*:—

Elder, Smith & Co's Ceres Superphosphate.—Water-soluble phosphate (36 per cent.), 38.1 per cent., 38.7 per cent., 39.3 per cent.

Elder, Smith & Co.'s Lawes' Superphosphate.—Water-soluble phosphate (36 per cent.), 39 per cent., 39.6 per cent., 37.3 per cent., 37.3 per cent., 39 4 per cent.

Norman & Co.'s Superphosphate.—Water-soluble phosphate (35 per cent.), 36.6 per cent., 37.2 per cent., 38.7 per cent.

Norman & Co.'s Reliance Superphosphate.—Water-soluble phosphate (32 per cent.), 35.1 per cent.

George Wills & Co.'s United Alkali Company's Superphosphate.—Water-soluble phosphate (36 per cent.), 37.4 per cent., 38.4 per cent.

Adelaide Chemical Works Co.'s Mineral Superphosphate.—Water-soluble phosphate (36 per cent.), 39.3 per cent., 41.9 per cent., 38.5 per cent , 40.5 per cent

Wallaroo Phosphate Co.'s Superphosphate.—Water-soluble phosphate (36 per cent.), 39 3 per cent., 41.2 per cent., 39 per cent.

Clutterbuck Brothers' United Alkali Co.'s Superphosphate (Planet Brand) —Water-soluble phosphate (36 per cent.), 37.6 per cent.

Clutterbuck Brothers' Special Superphosphate.—Water-soluble phosphate (37 per cent.), 38 7 per cent.

D. & J. Fowler & Co., Limited, Lion Brand Superphosphate.—Water-soluble phosphate (36 per cent), 44 3 per cent., 43.3 per cent.

D. & J. Fowler & Co., Limited, Lion Brand Superphosphate. -Water-soluble phosphate (39 per cent.), 45.4 per cent., 44.3 per cent.

Adelaide Chemical Works Co.'s Bone Superphosphate.—Nitrogen (2.1 per cent.), 1.8 per cent.; water-soluble phosphate (15.2 per cent.), 22.8 per cent ; citrate-soluble phosphate (15 8 per cent.), 12.2 per cent.; acid-soluble phosphate (6.8 per cent.), 4.3 per cent.

Adelaide Chemical Works Co.'s Guano Superphosphate.—Water-soluble phosphate (25 per cent.), 33.8 per cent., 33.7 per cent., 35.2 per cent., 34 4 per cent., 35.1 per cent.; citrate-soluble phosphate (5 per cent.) 2.4 per cent., 3 7 per cent , 1 7 per cent., 1.5 per cent., 2.5 per cent.; acid-soluble phosphate (3 per cent.), not tested.

Adelaide Chemical Works Co.'s Bonedust.—Nitrogen (3.5 per cent.), 3.7 per cent.; acid-soluble phosphate (45 per cent.), 43.4 per cent.

Crompton & Son's Bonedust.—Nitrogen (3.9 per cent.), 3.9 per cent ; acid-soluble phosphate (44.67 per cent.), 45.2 per cent.

E. Anders & Son's Victor Bonedust.- Nitrogen (3 per cent.), 4.1 per cent.; acid-soluble phosphate (42 per cent.). 45.5 per cent.

Adelaide Chemical Works Co.'s S.A. Super.—Water-soluble phosphate (30 per cent.), 34.6 per cent., 35.6 per cent., 33.8 per cent., 34.6 per cent.; citrate-soluble phosphate (2 per cent.). 1.6 per cent., 1.4 per cent., 3.9 per cent. 1 4 per cent.; acid-soluble phosphate (3 per cent.), not tested.

Adelaide Chemical Works Co.'s Wheat Manure.—Nitrogen (1.05 per cent.), 0.95 per cent.; water-soluble phosphate (28.1 per cent.), 28.8 per cent.; citrate-soluble phosphate (5.9 per cent.), 6.5 per cent.; acid-soluble phosphate (6 per cent.), not tested.

Adelaide Chemical Works Co.'s Hay Manure.—Nitrogen (1 per cent.), 0.65 per cent.; water-soluble phosphate (30 per cent.), 31.1 per cent.; citrate-soluble phosphate (2 per cent.), 4.9 per cent.; acid-soluble phosphate (3 per cent.), not tested.

Adelaide Chemical Works Co.'s Super B —Water-soluble phosphate (15 per cent.), 36.7 per cent.: citrate-soluble phosphate (15 per cent.), 3.7 per cent.; acid-soluble phosphate (5 per cent.), not tested.

AGRICULTURAL BUREAU CONFERENCE.

SOUTHERN BRANCHES.

The Eleventh Annual Conference of the Southern Branches of the Agricultural Bureau was held at Strathalbyn on Thursday, March 24, the following members of the Bureau being present:—Strathalbyn Branch—Messrs. M. Rankine (chair), W. M. Rankine, Miekle, Tucker, Reed, Butler, McAnaney, Cockburn, Watt, and Cheriton (Hon. Sec.). Meadows—Mr. W. Pearson. Finniss—Messrs. Henley and Collett. Hartley—Messrs. C. and W. Brooks. Port Elliot—Messrs. W. E. and W. W. Hargreaves. Sir J. Lancelot Stirling, K.C.M.G., Messrs. F. Krichauff (Council of Agriculture), George Quinn (Horticultural Inspector), W. L. Summers (Inspector of Fertilisers), George Jeffrey (Wool Expert), and several other visitors were also present.

Mr. J. Cheriton, in asking Sir Lancelot Stirling to take the chair, expressed regret at the poor attendance, stating that several Branches which had promised to send delegates were not represented. He was greatly disappointed at the apathy dispayed by the neighbouring Branches.

Sir Lancelot Stirling said as an old member of the Bureau he was pleased to be present, and expressed regret at the poor response to the Secretary's labours. He thought the Branches should regard these Conferences as of greater importance than they did; unless they were educational they were of no value. One special advantage of them was that the members wer afforded the opportunity of meeting the experts attached to the Department of Agriculture, whose many duties rendered it impossible for them to visit the Branches separately. If the Conferences were to be continued he suggested that the head of the Department should arrange for several of the experts attending each Conference instead of spending their time in attending merely Branch meetings. Speaking for himself, he could say that he had benefited to a considerable extent from the lectures of these experts. He suggested that future Conferences at Strathalbyn should take the form of a farmers' annual dinner, with addresses by, say, two officers of the Department in the evening.

Mr. Krichauff supported the remarks on the necessity for better attendance. It was unreasonable to expect the Department to send officers to attend these meetings if the members of the Bureau took no interest in them.

DAIRYING

Mr. R. Caldwell forwarded a paper on "The Present Condition and Prospects of the Dairy Industry under Federation." It could not be disputed that interstate free trade had affected the market value of dairy produce to an appreciable degree; the prices of butter and cheese have suffered considerable reduction, and values have not fluctuated as they formerly did. During the dry season following the inception of federation the change was not felt to any extent, as each State had nearly as much as it could do to supply its own requirements; but with the return of better seasons the results cannot be mistaken. Under the former duty of 4d. per lb. on cheese and 2d. per lb on butter the former could not be imported until the local price of cheese had risen to 9d. or 10d. per lb.; and butter would not pay to import at a less price than 1s. to 1s. 1d. per lb., local price. The removal of these duties has had (for a time, at any rate) a depressing effect on the market prices for first-quality dairy products. As a very much larger business is done in the Eastern States, it is only natural that they should have a considerable quantity of inferior butter and cheese which they would not care to export to London; hence this must be put on the local markets, to the detriment of first-quality goods. It is not at all unlikely that a considerable quantity of this inferior butter and cheese is now being dumped, and will continue to be dumped, on the Adelaide market. Apart from this point, however, there comes the vital question of the price at which milk can be produced. The South Australian dairyman requires an average of 3½d. to 4d. per gallon to make a living wage: but in Victoria and New South Wales, if with cheaper land or better pasture milk of equal quality can be supplied to the factory at 2½d. per gallon, it will be admitted that the South Australian farmer is at a great disadvantage. He would not say that their neighbours could undersell them with first-quality produce: but there was nothing to prevent their placing their inferior goods on our market, thus depressing prices all round. The dairyman must face the fact that the high prices ruling n former years are scarcely likely to be realised under ordinary conditions in the future. The hope of the industry lay in the export to London, and to do business there it was to their advantage to send only first-class produce. The unsatisfactory methods must be discontinued; manufactory, plant, and management must be up to date. To begin at the beginning, greater care needs to be taken to secure the supply of purer milk; fewer home separators should be used. First-quality butter cannot be made from different blends of cream, though the separating has been carefully done, and the appointments of the dairy are cleanly. The best results can only be obtained by delivering sweet milk at the factory, and having it separated under the best conditions. If first-class butter and cheese are made a fair value will always be obtained, but if the quality is not maintained they were bound to suffer. In the event of the adoption by Great Britain of preferential trade with the colonies it was not unlikely that conditions will become more favourable for the exporting dependencies All the more reason why greater effort should now be made to secure a good position in the home market. There is no reason why the dairy industry should not become one of the most profitable of these having to do with the utilisation of land. It should be an easy matter to double or treble the present output. Although federation has had an effect on the operations of the dairy farmer, it must be admitted that the conditions are more natural than those that existed previously. Before federation the conditions were highly fictitious. Producers had no right to expect the continuance of such conditions. The protective policy under which the dairy industry was established was only intended to serve a temporary purpose. So far as the future was concerned it is safe to forecast for the dairy industry a lower but more steady and reliable colonial market, with improving conditions in Great Britain, unless they neglected their responsibilities or spoiled their prospects by legislative interference.

Considerable discussion followed. Mr. Cheriton agreed that land in South Australia was too dear, and did not think that under present conditions dairying could be made to pay unless the work could all be done by the family. Mr. Cockburn did not agree that Victorian dairymen produced milk cheaper on account of the cheaper land. He had been through some of the best dairying districts there, and was surprised at the high rates ruling. For land that fetched up to £5 per acre he would not give 30s The main secret of Victoria's success was that dairying was carried out on a larger scale and in a thorough manner. Mr. Pearson contended that the home separator had proved the greatest enemy of the industry in this State Factories had been started, and at first with a good supply of milk it had been possible to pay 4d. per gallon when butter averaged 11d. to 11½d. per lb Now, owing to decreased supplies, due to the use of separators on farms, the working expenses were proportionately much heavier, and naturally they could not pay so much for the milk. This meant that other supplies were threatening to leave, and he was certain that either the private separator must go or many of the factories would have to close. Dairymen would then find to their cost that they had "killed the goose that laid the golden eggs," and extreme low prices in the glut season would prevail. Sir Lancelot Stirling regretted that he must agree with Mr. Pearson's forecast. He admitted that often the man using the separator got more for his milk than he would get at the factory, but this could not last, as they must depend for the mainstay of the industry on the London market. Unless, however, they sent first-class butter of fairly uniform quality they would soon be ousted by their rivals, and disaster would result The factory could not pay the same price per gallon on a small quantity of milk as when handling a full supply He found that when the factory was working to its full capacity the cost of manufacture, etc., amounted to about 1½d. per lb., whereas when only a very small quantity of milk was being treated the cost amounted to 5d per lb. It was a significant fact that practically all the prizes at the Adelaide Show were won by factories which refused to handle cream separated on the farm.

BACTERIOLOGY.

Mr. F. Krichauff read a paper on this subject, dealing with the work of the various ferments or bacteria, and their value to the agriculturist.

BLEACHED WHEAT.

Mr. M. Rankine read a paper on this subject.

Considerable discussion followed Mr. Watt stated that what might be termed over-ripe wheat was not objected to by buyers. He found that one or two showers of rain did not injure the standing crop, but continuous cloudy weather afterwards would result in bleaching. Mr. Henley thought most of the damage was done in the heaps. Reference was made to proposed tests by the Department of the flour-making qualities of bleached wheat. Mr. Summers said he was afraid that, whatever the result of such test, the millers would stick to what their practical experience taught them, and if the farmer would not submit to the reduction for bleached wheat the miller would refuse to purchase. Strong exception was taken by several to the weight of wheat being judged by such small measures, which made it nearly impossible to accurately estimate the weight per bushel. The varying weights given by different buyers for the same sample were quoted as proof of this. Mr. W. M. Rankine said the farmers were, under the present conditions, entirely in the merchants' hands. They could not dictate how the merchant was to test the weight, nor the price he should give. They could only accept or reject the buyers' terms and try to get better elsewhere.

PROSPECTS OF THE FRUIT INDUSTRY.

Mr. George Quinn gave an address on this subject, reviewing the position of the industry and the prospects for the future. He particularly mentioned currants as a profitable line to develop, as the present consumption of this article within the Commonwealth would require the product of several thousands of acres beyond the area already planted. As soon as the local demand was overtaken, which, however, would not be for many years, it would be necessary to stop planting, as they could not compete with the Greek currant-growers in the open market. There was not very much encouragement for any large extension in the raisin industry, as in most classes the local demand was already met. With other dried fruit, particularly apricots, prunes, and apples, there was room for expansion. Apricots and currants would do well in this district. The rainfall was scarcely sufficient for apples. There was a good demand for the fruit of the almond in the neighbouring States, and, as they did not appear to thrive so well there as in South Australia, he would advise more attention being given to the cultivation of the almond. It was, however, to the apple industry that he looked for the greatest development. They grew in South Australia fruits unsurpassed in any of the States. It only required some reductions in freights and other charges to enable them to put their apples on the London and Continental markets at a price that would lead to a very large increase in the demand. With the present high prices, only a limited circle could afford to buy our fruits in London, but a reduction of a few shillings per case would place the fruit within the reach of a vast population. Pears also would, he believed, be largely exported in the future. It was true that they did not always carry well, but this, he was convinced, would be overcome in the future.

Mr. Miekle referred to the fact that the currant industry depended entirely upon the retention of the present duty on imported fruits, and questioned whether the whole community would rest content to be taxed for the benefit of a few hundred currant-growers. Besides, it only needed the production of a few hundred tons beyond local demand to bring prices very low. The amount of labour involved in the drying of apricots was a serious objection to any marked advance in this industry. Mr. Summers pointed out that if they were to consider the possibilities of customs duties being removed there were other industries than currants that would soon be in a state of stagnation. Protection was apparently the settled policy of Australia, and it was only reasonable to suppose that the products of the soil would continue to receive assistance in this way. He believed that apricots would pay. It was more profitable to dry the fruit than to accept less than 8s. per case for first-class fruit. He was afraid that the labour of gathering the almonds was the main reason why more were not planted. Ordinary labour was too costly.

WOOL AND SHEEP.

Mr. George Jeffrey gave a short address on this subject. Where conditions were favourable nothing was more profitable than the breeding of fat lambs. The selection of the ewe was of the greatest importance. Where they could be obtained, pure or half-bred Merino or half-bred Down ewes were to be preferred. A good big-framed ewe was required. Where it pays to breed fat lambs it does not pay to rear ewes for breeding. He would buy the proper type of ewe, get two or three lambs from her, and then sell her to the butcher. He admitted, however, that just at present it might be a little risky for the farmer to sell all his ewe lambs, as he might not be able to buy ewes again next season at a reasonable price; but, as a general practice he was emphatic in his opposition to rearing ewes for breeding on the farm. Then he would advise the fat lamb raiser to sell all his lambs when the bulk were fit. It was a mistake to keep the culls. It was better to make the first loss the last than to keep the culls for sale later on as ewes. He favoured one of the Down breeds or the Dorset-Horn rams: the progeny of the Lincoln ram was not so shapely, nor did it come to maturity so early. Dealing with the question of wool, he would not advise small growers to attempt elaborate classing. With, say, 200 Merino sheep, he would advise to skirt carefully, and not too deeply, where the sheep are running on the fallows. Trim off only the dirty edges, then roll up the fleece neatly. Divide out the faulty, discoloured, and coarse fleeces, and put them into separate parcels. With better classes of wool and sheep not running on cultivated ground, skirt a little deeper, and get off the worst of the belly wool. Keep the belly wool separate from the fleeces. He strongly recommended growers not to hamper their agents with reserves on their wool. The auctioneer will naturally do his best for his client, as he is paid according to the price he obtains, and in most cases he was a better judge of the market values of the wool than the grower.

Considerable discussion ensued. Mr. W. M. Rankine did not agree with the advice to sell off all the lambs at the same time. He found it paid better to keep the rams with the ewes longer than was the general practice, and to keep the late lambs, which fetched good prices later on in the season. If it paid dealers to buy culls and late lambs to fatten it would pay the farmer to keep them, instead of letting the grass go to waste. Mr. Jeffrey said they should keep more ewes if they had the grass; but Mr. Rankine pointed out that often in this district, if they had enough ewes to eat the grass in October and later, they would be overstocked in May and June, and the lambs would suffer. Mr. Watt said that was his experience, and he agreed with Mr. Rankine. The Chairman agreed that in large flocks it would pay to follow Mr. Jeffrey, but with small flocks that was not always the case. If they were under-stocked when selling the fat lambs it would pay to keep the small lambs for a while, but at the same time over-stocking must be avoided. In reply to a question why it did not pay to keep some of the ewe lambs for breeding, Mr. Jeffrey said they could raise two fat lambs while they were rearing one breeding ewe, and the lambs would bring in the more money. So long as it was possible to buy large-framed ewes that would give two or three lambs it did not pay the fat lamb raiser to breed ewes.

PRIVATE SEPARATOR *v.* FACTORY.

Mr. W. E. Hargreaves read a paper on this subject. For some time the private separator has been and is subject to severe criticism by some of their dairy experts and factory managers. To his idea that was wrong, it was throwing cold water on one of the farmers' best friends. He had read the opinion of several experts and factory managers on the subject, and confessed that he was surprised that such men tried to make farmers believe that the home separator was one of the chief causes of the inferior quality of butter, some going so far as to say that to save the industry from ruination they must return to the old method of sending their milk to the factory. In his opinion that would be an unprogressive step, and would not remedy the evil. He did not wish it to be understood that the factory would not pay as well as the private separator, for he had sent milk to the factory for years with satisfactory results. Let them compare the two methods, taking milk to the factory or the private separator. The former system is a good one, that is, if the factory separates every day, and he would say to the farmer living within a few miles, "Take your milk to the factory, and I believe it will pay you as well as the private separator." The system that exists in a great many districts is for the factory to separate once a day, and often every other day, with the result that the milk is exposed to the tender mercies of all weathers, hot or cold. Perhaps after the farmer has carted this milk four or five miles, and in some cases a greater distance, it has gone completely sour. The manager will inform him it is "too far gone this morning, Mr. So-and-so; I am very sorry, but I am afraid I cannot put it through for you." The result is the farmer in this case is the direct loser. But, just for argument sake, admit that he is lucky enough to get it through; he is still a loser indirectly, for the cream from this stale and sour milk will not produce first-class butter, with the result that the factory does not get top price for the product from such stale milk, and at the end of the month the farmer gets less for his milk than he otherwise would have got had the butter been produced from the milk in a sweet condition. Now for the private separator. In the first place he maintained that the statements made by some of their factory managers *re* the small separator not producing butter of equal quality to the factory separator to be incorrect, for both use the same machine, only one has been reduced to hand power. It also brings the following advantages:—The milk can be treated sooner after milking than if sent to the factory, with the result that a much sweeter cream is secured than when treated by the factory which works every other day. The milk is separated twice a day, and as soon as it comes from the cow, without any artificial heating or carting long distances in the sun. It also saves the farmer a great deal of time and wear and tear, and, above all things, it is a great preventive against introducing disease into the young stock by feeding with milk from all sorts of cows, as forced to do if feeding from factory skim milk. On the other hand, if they should have a diseased herd, they would not be so apt to transfer the disease to the neighbours' herds. Why, then, in the face of these facts, which the critics must know to be true, do they advise farmers to take a step in the wrong way? While, however, praising the use of the private separator, he could not hold with the manner in which the valuable industry is abused. But who was to blame for this state of things? Now, just let them look at their own door first and see if the dirt is really not on it before they criticise their neighbours. As already stated, the farmer has in his possession cream of the choicest quality, but he allows it to deteriorate before he delivers it to the factory. Who is to blame for this, the dairyman or the company that takes the cream? When the man is told that if he delivers his cream once or twice a week he will receive just the same price for it as his neighbour, who delivers his every day, it is only natural that he will take advantage of this rotten system, and who can blame him? Let the critic face the position in a manly way, and not blame the private separator. Surely from new milk just from the cow they should be able to make as good butter as the factory can from milk two days old! To his idea, the real trouble rests on their own door, and the remedy they hold in their possession. Their motto should be "quality;" but to-day, he was sorry to say, it was "quantity," and this was the real cause of the trouble. It must end sooner or later, however, and they will have to separate the milk twice a day if they were to make first-class butter. He was positive many faults which were urged against the home separator could easily be remedied, and as their object should be to reduce the cost of production, the home separator is one step towards this end. No one would think of carting a stack to a threshing machine, and then carting the straw back home; yet that is the principle involved in carting milk to a creamery. The quicker milk is separated after milking, the better. The farmer can skim his milk without having to wait for his turn at the creamery, neither has he to wait for his skim milk; he also saves wear and tear, and reduces the volume of his product, so that it can be easily handled. If farmers were clean in their methods and delivered their cream in good condition at the factory, there is no reason why butter should not reach the highest standard of quality. Then, again, a man may be sending milk testing 4.5 or 4.6 to the factory, and only getting the same price as the man with milk testing 3.5 or 3.6. There was not much encouragement to keep good cows when they know their rich milk had to help pay for the poor—it only encouraged the farmer to keep the cow which gives the larger quantity of milk without regard to quality.

Mr. Pearson said no one in his senses would say that if the cream from the home separator was kept under proper conditions it would not make good butter, but it was impossible to make butter equal to first-quality factory butter from cream received from a score or more different sources where there was more or less neglect of absolutely necessary precautions to prevent contamination. If the separator butter was equal to factory butter, why was it that the former always realised better prices? Mr. Cockburn considered the separator a great boon to the farmer, and he would not cart his milk several miles to the factory. He admitted that factories taking only milk made a better product than factories buying cream, but this could be overcome if care and cleanliness on the part of the suppliers was insisted on. Mr. Watt agreed. He thought cream should be delivered to the factory every second day. If suppliers were allowed to keep the cream three or four days there was certain to be contamination, and it would then be impossible for the factory to turn out a first-class product.

NEXT CONFERENCE.

Considerable discussion took place on the question of holding a Conference next year. The Chairman said they must consider whether in the face of the indifference of the Branches they were justified in arranging another Conference. Strathalbyn was the most convenient centre in the South for such gatherings, but they got little support. It was suggested by several that no Conference be held unless the neighbouring Branches undertook to be represented, but Mr. Cheriton pointed out that if the promises of support he received this year had been fulfilled they would have had a good attendance It was finally resolved that the question be left to Strathalbyn Branch to arrange, subject to definite guarantee of support from the Branches interested, and that, in the event of the Conference being arranged, sessions be held during the afteroon and evening, instead of the morning and afternoon.

A vote of thanks to those who had taken part closed the proceedings.

DATES OF MEETINGS OF BRANCHES OF THE AGRICULTURAL BUREAU.

With a view of publishing in the "Journal" the dates of meetings of the branches of the Agricultural Bureau, Hon. Secretaries are requested to forward dates of their next meetings in time for publication.

Branch.	Date of Meeting.		Branch.	Date of Meeting.	
Balaklava	May —	June 11	Mount Remarkable	May 26	June 23
Booleroo Centre	24	28	Nantawarra	25	22
Bowhill	28	—	Naracoorte	14	11
Brinkworth	6	3	Norton's Summit	27	24
Burra	21	17	Onetree Hill	26	23
Carrieton	24	28	Orroroo	27	24
Cherry Gardens	10	14	Paskeville	28	25
Clare	27	24	Penola	14	11
Clarendon	9	—	Pine Forest	24	28
Colton	7	4	Port Broughton	26	23
Crystal Brook	28	—	Port Elliot	21	18
Elbow Hill	24	28	Port Lincoln	20	17
Eudunda	23	—	Port Pirie	28	25
Finniss	2	6	Pyap	4	1
Forest Range	26	23	Redhill	24	—
Forster	21	18	Reeves Plains	27	24
Gawler River	27	24	Rhine Villa	27	24
Golden Grove	26	23	Richman's Creek	30	27
Hartley	27	—	Riverton	28	25
Inkerman	24	—	Saddleworth	20	17
Kanmantoo	27	24	Stansbury	7	4
Kapunda	7	4	Stockport	30	27
Kingscote	9	13	Strathalbyn	30	21
Kingston	7	4	Utera Plains	28	25
Koolunga	26	23	Virginia	23	27
Maitland	7	4	Wandearah	23	27
Mallala	2	''	Watervale	23	27
Mannum	21	18	Whyte-Yarcowie	21	18
Minlaton	21	18	Willunga	7	4
Mount Bryan East	28	25	Wilmington	25	22

AGRICULTURAL BUREAU REPORTS.

Orroroo, April 22.

Present—Messrs. Moody (chair), Copley, Harding, Matthews, Robertson, Roberts, Lillecrapp, Brown, and Tapscott (Hon. Sec.).

Membership.—This Branch approves of alterations in membership rules suggested by Wilmington Branch.

Dairy Cattle.—Considerable discussion on various breeds of dairy cattle took place, and it was resolved that for the North the Jersey-Shorthorn cross was most suitable.

Bunt.—The Hon. Secretary read a paper on pickling with bluestone.

Forster, April 22.

Present—Messrs. W. Johns (chair), Payne, E. and A. Schenscher, F. and J. Johns (Hon. Sec.), and visitors.

Hon. Secretary.—Mr. J. Johns was appointed Hon. Secretary.

Scour in Horses.—Mr. E Schenscher wished to know how to cure this trouble. Pollard was recommended by several members, while one found a few handfuls of raw wheat in the feed effective.

Fertility of Eggs—Mr. W. Johns wished to know how long eggs would remain fertile after the rooster is removed. [While eggs have proved fertile up to two or three weeks after the rooster is removed from the hens, it is not advisable to use such eggs beyond the fifth to seventh day.—Ed.]

Manure per Acre.—Members consider 50 lb per acre of super sufficient to sow in this district.

Saddleworth, April 15.

Present—Messrs. Frost (chair), Benger, Eckermann, Hannaford, Klau, Leeder, Plant, Scales, and Coleman (Hon. Sec.).

Pickling Seed Wheat.—The majority of members pickle in a heap on barn floor, using ½ lb. of bluestone to a bag of seed wheat, using five to six gallons of water to two bags—the usual quantity pickled at one time, 1 lb of bluestone to 15 gallons water was proportion used by one member when pickling in a cask. A trial of formalin and smut dressing is being made this season Some think bleached seed would be safe to sow unpickled if it had not come into contact with any smutty wheat in being harvested.

Impaction.—Some farmers are again troubled with this complaint among their cows. In some cases last year's remedy failed this season. One member recommends Berge oil.

Losses through Eating Stinkwort—A few sheep, young hoggets, as well as ewes out of the lambing flock have died. The prevalence and strength of the weed this season make it difficult to escape.

Stubble Burning.—This has been done more than usual, for purpose of killing stinkwort, wild melons, and the extraordinary growth of weeds and thistles caused by summer rains.

Continuous Manuring with Phosphates.—The Chairman questioned if this would prove exhaustive. It had been noticed that the best crops had been obtained after the first application of manure to the land. Time alone will settle the question, and local experiments to be commenced this year will be watched with interest year by year.

Kapunda, March 5.

Present—Messrs. Shannon (chair), Teagle, Morris, Holthouse, Weckert, O'Sullivan, Banyer, and Harris (Hon. Sec.), and one visitor.

Pigs and Bacon-curing.—Mr. Holthouse read a paper on this subject. For general purposes he advised the selection of good, strong, vigorous sows, which he would mate with a purebred Berkshire, Essex, or Suffolk boar. For the first few hours after the sow farrows give her nothing but water, not too cold. Afterwards give a small ration of bran in warm water, increasing and varying the diet according to circumstances. Milk, cooked vegetables, meal, crushed or boiled grain, are all valuable for pigs of any age. Weight for weight wheat was the most nutritious of grains, and should be largely used for topping up when it is cheap. A pig must be fed liberally all its life. A dry, warm pen, with a liberal supply of pure water, and plenty of clean straw, should be provided. Cleanliness and good treatment are the best medicines for pigs. In this State there was no reason why, with everything in their favour, farmers should not successfully compete in pig products with the farmers of the United States and Canada. On most farms sufficient variety of food can easily be raised to fatten ten to twenty pigs each year, or five to ten breeding sows can be kept. In curing bacon he followed a recipe given him by the Hon. J. Lewis. For 100 lb. of meat take 2 oz. well powdered saltpetre, 3 lb. salt, 2 lb. dark sugar, 1 lb. allspice, and 1 oz. carbonate of soda, and mix well together. Rub the meat first with 1 lb. of honey to the 100 lb., then rub with the mixture, using about two-thirds of the preparation. Place the meat with the fleshy side up in a vat or tub placed in a cool place, with plenty of fresh air. In twenty-four hours turn and rub again, adding a little more of the mixture, after which turn and rub once every forty-eight hours for six times, using some of the mixture each time. It should be packed closely in the vat, so as to raise the brine as high as possible. Always keep the hands and hams at the bottom of the vat. After remaining in pickle for twenty-one days, take out and scrub with a scrubbing brush, using hot water. After thoroughly curing soak in cold water for ten hours, then hang up in a dry place (not in a cellar), where there is a good draught. If flies are troublesome it is advisable to stop up any cracks or crevices with lard, then dust them over with a little pollard, which will stick to the oily substance and form an artificial skin. After hanging from fourteen to sixteen days it should be ready for the smokehouse. The wall of the house should be 12 ft. high. The smoke should be conducted to the bacon as cool as possible. Hang the hams and bacon close to the top, in rows about 6 in. apart. Stinkwort makes an excellent smoke. He kindles a small fire on the floor of the smokehouse, then places a few handfuls of stinkwort, that has been gathered while the sap was in it and stowed away till dry, on the fire. After it is nicely alight put a few handfuls of sawdust on the top, then place a sheet of galvanized iron on the top of the fire, which will cause it to smoulder and produce smoke only. About 3 ft. above the fire suspend another piece of galvanized iron to prevent any heat from the fire reaching the bacon. It usually takes about ten days to smoke properly, making a smoke as before mentioned every other day. After leaving the smokehouse it is well to go over the hams and hands with lard and pollard, and stop up any place that is likely to be attacked with flies. It is a good plan to place the hams and hands in calico bags, taking care to tie them tightly at the top. Hang them in a warm place. He had strips of 3 x 3 deal fixed to the kitchen ceiling, with hooks screwed into them, and suspends the bacon there until the weather gets warm; then packs it away in bran and sawdust, which must be dry. It should be taken out every six weeks and examined, and if found to be getting mildewed or to be sweating it should be rubbed dry with a cloth; then add a little chaff to the sawdust or bran. If bran is used be sure to see that it is free from mite. If possible, keep the hams and bacon in an even temperature. Too much heat will cause the fat to melt and turn rusty, and if too damp it will sweat and decay. By curing and treating bacon by this process they would have an article that will always command a good price and will keep for many years. The fat remains sweet and the lean soft and savoury. This treatment is based on a pig weighing 200 lb. A smaller one does not require to be kept in pickle or smokehouse so long. A heavier pig would require to be kept longer. The longer they use the brine the better it is. It may require boiling occasionally. He had found it a good plan to bury the hams in fine, clean wood ashes after sewing in calico bags. Mr. Teagle stated he kept his pork covered with clean salt for about twenty-four hours; then rubbed well in a mixture of 1 lb. brown sugar, 3 lb. salt, and a little saltpetre (an ounce to 2 cwt. of meat was sufficient). Fourteen days later he cleaned the salt off and dressed the bacon with sugar, then smoked it for forty-eight hours. To give a high colour, use damp chaff and stinkwort, firing the latter, and then putting the chaff on top. Mr. Domeyer said the treatment of the bacon should depend upon the age of the meat The meat of young pigs should be coloured darker than that of old pigs. Stinkwort and chaff were very good for smoking. The quantity of sugar used would depend on whether hard or soft bacon was wanted. A pig fed on slops made light bacon, and to secure the colour desired for market smoking with stinkwort was effective. For a light colour smoke with wattle bark and sharp sand. He found pigs paid him well. If a good class of bacon is produced pigs pay better than sheep. They would pay at an average price of 3½d. per lb. He grew crops of sorghum, millet, rye, kale, barley, wheat, etc., for his pigs. Heavy manuring was necessary to secure the best results. He sowed kale in November, and applied 2 cwt. of super per acre. On two acres of this crop he kept between seventy and eighty pigs for three weeks. These crops required to be sown in rows and well cultivated during growth.

Davenport, March 24.

PRESENT—Messrs. Trembath (chair), Hewitson, McDowell, McDonald, Hodshon, Holdsworth, Roberts and Lecky (Hon. Sec.).

LOCUSTS.—Mr. T. Hewitson read an interesting paper on locusts, describing their life history, habits, and powers of destruction Some discussion ensued on the question of protection of gardens and crops from their ravages.

BINDING SAND DRIFTS.—Mr. McDonald called attention to reported successful reclamation of drift sand at Wellington by the sowing of the ordinary blue lupin. In Port Augusta marram grass had not been a success, but he thought it would be well to try lupins. It was decided to get some seed for experiment. Mr. Hewitson thought they could get nothing better than couch grass for binding the sand.

Bute, March 29.

PRESENT—Messrs. Trengove (chair), Barnes, W. H. and A. Sharman, McEvoy, Cousins, and Hamdorf, and one visitor.

SAND DRIFT.—Mr. S. Trengove read a paper on the drift difficulty. While the advent of the drill and manures has been of great benefit to the district, it has brought also some difficulties, one of the most serious of which is the drifting of light, sandy soil. Previous to the use of manures this land did not pay to cultivate, and was covered with scrub, which has now been cleared, with the result that in the dry weather it drifts badly. Although the heavier land benefits from the top dressing of sand it receives, fences are buried, roads made impassable, and the drift is a general nuisance Owing to the greater growth of feed after manuring sheep are now kept on most farms, and this only accentuates the evil. The causes of the drift may be described as the profit-earning factors on the farm, and the debatable point is: Will these have to go? Without them he had little doubt the drift would soon be overcome, but he thought the drift could be reduced to a minimum without sacrificing the profits of the farm. When fallowing he would leave a strip a chain in width around the line of fence unploughed, and would not allow sheep on sandy fallow. It might be as well to allow the grass to grow on this soil, instead of fallowing it, burning off the grass before preparing the land for seeding. If the land is fallowed, allow it to lie rough, and do not harrow it. Care in these directions, coupled with the adoption of the practice of only ploughing sandy land when wet, he had found efficacious in controlling the drift.

Port Pirie, March 26.

Present—Messrs. Wright (chair), Johns, Jose, Lawrie, Crispin, Spain, Hector, Smith, and Wilson (Hon. Sec.), and one visitor.

Farm Garden.—Mr. T. C. Jose read a paper on this subject. Many papers had been read on this subject, and in most cases the writers assert that every farm should have its garden. He would not go so far as this, as in his opinion it the farm does not possess an individual with a taste or inclination for gardening it would be better not to attempt the work. In many instances, however, it will be found that, if the male members have no such taste, the women or perhaps even some of the children have, and if they are assisted and encouraged in every possible way they would be glad to attend to a garden, and besides the value of the produce, they would greatly benefit from the light, healthy, outdoor exercise. The site chosen must be near the house. The quality of the soil is not of so much importance. It should be broken up to a good depth with the plough. If sandy, it will be much easier to work, but if stiff or inclined to set, it can be greatly improved by working in plenty of long stable manure, ashes, etc. Occasional dressings of lime or gypsum will have a marked effect in rendering such soils loose and friable. The garden should be enclosed with 6 ft. wire-netting, let into the soil to a depth of 6 in. to 8 in. Strong, straight posts, 9 ft. apart, and 6 ft. above ground, will be required; a barbed wire along the top of the posts is almost a necessity. Have one gate large enough to admit a cart, and a small, self-closing gate for ordinary work. Unless the small gate closes with a spring it is sure to be left open by some one sooner or later, and poultry, rabbits, or other vermin will get in. A breakwind some distance outside the fence will be necessary in most cases. If this is not obtainable naturally trees should be planted for the purpose. A plentiful supply of water was essential to success, and the best way to apply it was by means of sprinklers. Failing this, the water should be applied in furrows between the rows of vegetables. These furrows will require to be broken up or filled in again as soon as the soil is dry enough to work. Where water is not plentiful, constant stirring of the surface soil is necessary to make the most of the moisture available and to keep down the weeds. The main object is to keep the plants always growing, as vegetables that receive a check during growth are never so tender and good, and are more liable to injury from insect and other attacks. A succession of plants for the garden should be raised in boxes nearly filled with a mixture of soil from an old woodheap and coarse sand, with a little fine stable manure added. A wooden frame, covered with old hessian or sacking, will be useful for covering the seed boxes in hot or very severe weather Some fruit trees should be planted in the garden. Set them 25 ft. to 30 ft. apart, and grow vegetables between them. A few vines should be planted in a place by themselves, and the land kept well cultivated during spring and summer. In deciding on the size of the garden bear in mind that a small garden well attended to will be more satisfactory than a large area more or less neglected. Considerable discussion ensued. Mr. Hector considered a garden a necessary adjunct to the farm. It should be laid out so that it can all be worked with horse implements, except, of course, between the rows of vegetables. Several members condemned the planting of gum trees near the garden, as they robbed the land of moisture. Some members reported failure, others great success, with their gardens.

Wheat Experiments.—Mr. Johns tabled a number of wheats, and reported as follows:—Yandillah, flinty grain, good yielder, suitable to this district; Gamma, rust-resisting, but not suitable to this locality; Sunset, a rust-resisting variety, from a few grains received three years ago he now had 75 lb; Carbine was similar to Sunset, but a better yielder; Waddy, short straw, good yield, but very rusty; Boomerang was similar to Waddy; John Brown, rust-resisting, fairly early, stands well, a good wheat; Phillis Marvel, a good wheat; Comeback, early, rust-resisting, a promising wheat. Mr. Spain stated that from his early sown Phillis Marvel he reaped 18 bushels per acre, but the later crop was not so good. He considered this variety good for hay, but for grain it went off too quickly.

Harrowing Growing Crops.—Mr. Johns said his experience of harrowing the crop just before rain. was very favourable, but it was a mistake to harrow in dry weather.' All members except Mr. Lawrie, who contended that it paid to harrow every season, agreed with Mr. Johns.

Inkerman, March 29.

PRESENT—Messrs. C. H. Daniel (chair), Smart, Kennedy, Sampson, Board, Lomman, Warner, and C. E. Daniel (Hon. Sec.), and two visitors.

BEST WHEATS FOR DISTRICT.—Mr. Sampson initiated discussion on this subject. All present expressed their intention of sowing largely of Marshall's No. 3, and amongst early wheats Neumann's, King's Early, and Gluyas will be mainly sown. Dart's Imperial, Baroota Wonder, Silver King, and Carmichael's Eclipse were all favourably mentioned by different members. Most members thought it was not too early to start seeding, but care must be taken not to sow too deeply, 1 in. being considered deep enough.

MANURE BAGS.—A member asked why it was that some supers destroyed the bags, while other brands, containing the same percentage of phosphoric acid, appeared not to affect the bags at all. Another member wished to know whether ordinary guano could be mixed with super without injury. [It is the sulphuric acid in the super, and not the phosphoric acid, that injures the bag. Some brands of super appear to carry a larger percentage of sulphuric acid than others, and the bags suffer accordingly. Guano could be mixed with super without much risk of reversion, provided it is used at once. If kept for any length of time there would probably be considerable risk of reversion of the water-soluble phosphate.—ED.]

Rhine Villa, March 31.

PRESENT—Messrs. G. A. Payne (chair), Farey, Lewis, F. F. and H. W. Payne, Hecker, W. T. and J. Vigar (Hon. Sec.).

SALTBUSH.—Two members reported that they had noticed a good deal of saltbush flourishing during the present summer, and thought the seeds must have been distributed by the heavy winds experienced during the previous year. A hardy variety of grass, since identified as Tragus racemosus, had been noticed in places in the district, and was thought to be useful. The plant known in this district as ice plant is a good fodder, and probably indigenous.

Eudunda, March 28.

PRESENT—Messrs. Gosling (chair), Pfitzner, Sieber, Schwarz, Krummel, Walter, and Weil.

RUST-RESISTING WHEATS.—Mr. W. H. Marshall forwarded a paper on "A Lesson from the Past Season and the Drought," dealing mainly with the question of red rust, which, he said, was responsible for more loss than all other causes put together. Could this loss have been avoided? He had no hesitation in saying: Yes, to a very great extent at least. It had been demonstrated that they had a number of rust-resisting or rust-escaping wheats which, as regards yield and quality, were quite equal to other varieties. He was convinced that if the farmers had sown nothing but rust-resisting varieties the wheat yield would have averaged several bushels per acre more than it did. This represents a direct loss of scores of thousands of pounds to the State. In addition it must be remembered that owing to rust very large areas of wheat were cut for hay, and the consequence was that instead of hay being worth 30s. to 35s. per ton, it had realised only from 17s. 6d. to 25s. This also represented a great financial loss. They were as farmers under a great debt of gratitude to those who had been to so much trouble in raising rust-resisting wheats. Another lesson taught by the drought was the necessity for sowing in dry districts wheats known to be drought-resisting, if such were obtainable. Practically no attention had been given to this, and while he admitted it would prove more difficult of solution than that of rust-resistance, still he believed that it was worthy of careful study. It would be a wise proceeding for the Government to undertake experiments, through the Branches of the Bureau in the dry areas, with this end in view, as it would entail too much work and expense for the individual farmer to attempt. A short discussion followed.

Appila-Yarrowie, March 23.

Present—Messrs. Keller (chair), Catford, Wilsdon, Lawson, Daly, Klemm, Becker, Bottrall, and Fox (Hon. Sec.).

Standard Sample.—Discussion on this subject took place. Mr. Fox strongly condemned the unfair treatment meted out to growers who delivered wheat before the standard for the season was fixed. Then, in reference to the docking, if wheat one pound under the standard was worth 1d. per bushel less than the standard sample, then wheat weighing over standard must be worth more. Other members agreed.

Maitland, April 2.

Present—Messrs. Bowman (chair), Jarrett, Treasure, Hill, Heinrich, Hasting, Lamshed, Williams, Bawden, Smith, Kelly, and Bowey (Hon. Sec.).

Bleached Wheat.—Mr Jarrett initiated a discussion on this subject. He had weighed 12 oz. of wheat, wetted it, and dried it. After drying it weighed a little more, equal to about 2 ℔. on the bushel, but at the same time there was a considerable increase in the bulk, the consequence of which was that a measured bushel would weigh less than before the grain was wetted. Unless, however, the bleached wheat was actually inferior for milling purposes it was unfair for millers to dock bleached wheat. Other members agreed, and it was unanimously resolved that this Branch is dissatisfied with the way farmers were treated by the buyers last year with respect to bleached wheat, and would advise members to deal with the Farmers' Union The question of the cost of bags, and "bags as wheat" was also discussed, and it was resolved that the Farmers' Union be asked to consider the supply of cornsacks at more satisfactory prices and condition.

Stockport, March 28.

Present -Messrs. A. Branson (chair), Stribling, Thomas, Watts, Nairn, Bold, Megaw, C. Branson, and Murray (Hon. Sec.).

Seeding.—Mr. A. Branson read a paper on this subject. The preparation of the land for seed will, of course, vary with the locality and the soil Some farmers prepare stubble land by ploughing, others work it well with the cultivator, and, although he did not believe in cropping stubble land, still, if worked with the cultivator, and sown with oats or an early wheat and super, a very fair crop may be obtained. A better return for the labour and money spent can, however, be obtained from fallow. The fallow should be kept as clean as possible, and should be carefully prepared for seeding. Care must also be exercised to select good, clean, sound seed. As wheats varied in their characteristics and behaviour under different conditions, it was a good plan to sow several varieties. All seed wheat should be pickled. He did not think that the plan of drilling in the manure first and broadcasting the seed later on was as good as putting in seed and manure together. In seeding he would use one bushel of the smaller grain wheat per acre; with large grain a greater weight per acre was required. Mr. Nairn stated that last season a piece of land ploughed up and left rough gave a much better crop than land that had been well worked. In reply to a question Mr. C. Branson stated that he had sown some seed wheat pickled twelve months previously, and had good results. Members generally considered it advisable to pickle the seed some little time before sowing, so that it got quite dry. One hundredweight of manure per acre was considered sufficient to apply in this district.

High v. Low Grade Manures.—Some discussion on the guarantee and price of certain brands of manure took place. Members pointed out that 36 per cent. super, at £4 2s. 6d. per ton, cost 2s. 3½d. per unit; while 30 per cent. super, at £3 17s. 6d., cost 2s. 7d. per unit; and 36 per cent. super, at £4 5s., was equal to 2s. 4¼d. per unit. These figures showed the necessity for farmers studying the guarantees and prices before purchasing their supplies. The manure costing the least amount per ton was in this instance considerably the dearest.

Woodside, March 28.

PRESENT—Messrs Caldwell (chair), Fowler, Hutchens, Pfeiffer, Rollbusch, Johnston, and Hughes (Hon Sec)

BUSINESS —Mr Pfeiffer read a short paper on improving the breed of draught horses Mr Caldwell reported on visit to Mylor Typical Orchard.

Utera Plains, March 27.

PRESENT—Messrs Deer (chair), Hornhardt, Jacobs, and Ramsey (Hon Sec), and three visitors

PICKLING SEED WHEAT —Mr R Hornhardt read a paper on this subject He had tried various methods of pickling wheat, and found both pickling on the floor or dipping in barrel of bluestone pickle very effective in preventing bunt or smut Where, however, the seed is smutty, other treatment is necessary, as the drill will break the balls of smut and re-infect the seed He had found the following method very satisfactory with dirty seed —Get a barrel to hold 60 to 70 gallons, bore a hole in the bottom with an inch auger, and make a wooden peg to fit this hole Take a small bundle of straw, tie it in the middle with a piece of cord, the ends of which should come through the hole in the barrel, the straw being in the barrel Insert the wooden plug in the hole, place the pickle in the barrel, then pour in the wheat very gently The bunt balls will come to the surface and can be skimmed off, the wheat being left in the pickle for about ten minutes Withdraw the plug in the barrel and pull the cord attached to the straw at the same time, so that the straw will act as a strainer, permitting the pickle to escape without the wheat Considerable discussion on various methods of pickling followed

RAINFALL Mr Gale reported rainfall at Salt Creek for February at 0 73 in

Denial Bay, February 27.

PRESENT —Messrs Smith (chair) Starling Meier, Lowe, Croker, G J and W O Gale (Hon Sec), and one visitor

DISPOSAL OF WHEAT -Considerable discussion took place in reference to the selling of wheat on the West Coast, members generally being dissatisfied with the manner in which it had been carried on during the present season Members were also of opinion that some marked alteration was absolutely necessary, and it was decided to communicate with an Adelaide firm in regard to the possibility of disposing of wheat by auction at Port Adelaide

FERTILISERS —Mr W O Gale reported his experience in the use of seed and fertiliser drill, and was satisfied that with careful use the application of fertilisers to wheat crops on the West Coast would pay well

Redhill, March 29.

PRESENT—Messrs Stone (chair), Kelly, Wake, Treloar, Steele, Torr, Wheaton, Robertson, D and J N Lithgow (Hon Sec), and one visitor

SEED WHEAT.—Mr Treloar initiated a discussion on seeding He considered it essential to use only clean, pure seed, which should be thoroughly pickled He used 8 oz bluestone to the bag of wheat, and pickled on the floor He advised securing a change of seed occasionally from a stronger soil Mr Wheaton stated that he intended to try formalin pickle as a preventive of "black rust."

MANURES —Mr. Treloar read a paper on the subject of the judicious use of fertilisers, in which he advised careful consideration of the character of the soil in deciding how much manure per acre to use On rich, moist flats a heavy dressing of manure will cause very rank growth, on very dry land heavy dressings are also not to be recommended He would advise working the land to a fine tilth, with a solid seedbed, and would sow seed and manure together.

Clare; March 25.

Present Messrs Birks (chair), Kelly Bray, Knappstein, McCarthy, Martin, Dolan, Carter, and Greenway (Hon Sec)

Fruit Export - Mr J H Knappstein read the following paper on this subject If any one twenty years ago had advocated the growing of fruit in Australia for export to Europe in its fresh state he would probably have been ridiculed as a visionary But now, in addition to the regular weekly mail steamers, with an average cargo of 35,000 cases each, we have three or four other lines of boats employed in this trade averaging about one boat a week, and Tasmania alone is estimated to ship over 500,000 cases this season The season lasts about ten weeks, and the total quantity from Australia during this short period will not be much short of 650,000 cases The question naturally suggests itself, is this branch of our export trade likely to be overdone, and can the markets of Europe take more of this fruit at a remunerative rate to the local producer? London alone receives and absorbs fully 80 per cent of the fruit exported from Australia, and practically has the monopoly of this trade A few small shipments are made direct to Liverpool and Glasgow, but to the great industrial centres, such as Manchester, Birmingham, Leeds, and Sheffield, our fruit is practically unknown, and I was assured that on only very rare occasions, such as banquets of the very wealthy, was Australian fruit seen there, as the exorbitant prices asked by the London dealers, from 4d to 8d per apple, practically prohibits its consumption The British public is prepared to pay what we would consider big prices for good table fruit, and during the months of September and October last the ordinary price for apples and pears from the barrows in the streets of London was 2d each, and anything extra prime and showy 3d , and in the shops still higher This was for American fruit, as the fruit crop in Great Britain for 1903 was practically a failure What struck me as curious was that you could buy this American fruit in almost any other town in Britain at the same price, and on making inquiries I found that the Americans had an agent or branch in each town of any size, and thus regulate prices and supplies to their respective requirements and do not submit much of this fruit to the ofttimes slaughtering auction system If London with its 7 000 000 population, one-half of which cannot afford to buy Australian fruit even at 1d each, can take 500,000 cases of our fruit at 12s per case delivered there, it is not difficult to suppose that the other 20,000,000 of town population of Britain could absorb another million cases at least, if brought within their reach You will notice this provides for only 27 millions out of 40 millions of people in Great Britain Now about the Continent In Antwerp Brussels, Cologne, Bremen all big cities, our fruit is very little known, and in conversations with business people there I found they would all gladly buy our fruit at bigger prices than we are getting, as it comes in at a time when no other fruit is obtainable A certain amount of our pears and apples have gone to Hamburg with most satisfactory results, and I interviewed a few of the leading fruit merchants there, and all are eager to get more showing there is a big demand for it In Berlin and Cologne I saw invoices for Australian apples from Hamburg dealers at equal to from 28s to 31s per case A relative of mine in Cologne had one case with my name stencilled on, and therefore kept it, the variety being Jonathan, at 22½ marks, equal to 29s 3d per case on rail Hamburg This all tends to show the demand that exists for our fruit in Europe, and it is reasonable to assume that if fairly distributed among the larger cities of Britain at cost equal to London prices, and also at Continental ports, a much larger quantity could be dealt in without values suffering to any extent The risks of transit and safe delivery at the other end are still very considerable, and at times whole shipments of fruit are spoiled (or reported as spoiled and unsaleable), and as the freight, cases, etc , are prepaid here, the whole loss falls on the consignor, which to me appears quite unfair The shipping companies charge an extra high rate for the carriage of fruit in their cool chambers, but take no responsibility whatever of carrying fruit at a certain temperature, and if their clauses on the bills of lading are legal, they could practically do what they liked with the fruit, and carry it at any temperature they chose, or throw it overboard, and still we cannot make them bear the loss or any part of it. Some of us, myself included, remember the fiasco last season with one shipment of fruit to the Continent, practically the whole of which was reported as spoiled and useless, and we actually had to find the cash to pay the deficiency, in addition to losing the fruit and previous charges incurred This news reached me when in Europe, and being personally concerned I went to the head office of this shipping company to find out the cause. The manager indignantly disputed that the fault was theirs, and, to prove his contentions, he sent for the diary or logbook of the engineers in charge of the cool rooms, and pointed out quite proudly from this that the temperature had not varied 2½ degrees during the whole trip. He was quite right as far as the variation of temperature was concerned, but the temperature had averaged about 58 deg. Fahrenheit, instead of about 38 deg., as required. In this instance we had entrusted our goods to their charge to be carried home at a low temperature, and the engineer in charge of those cool rooms did not even know what was the right temperature to maintain the fruit in sound condition. At all events, this was his excuse, and the manager then said that we had not asked for a certain degree to be maintained, and they had done their best as far as they knew In fact, the whole blunder was the fault of the shippers in not giving the company proper information and instructions. Ultimately, they "generously" allowed one-third of the freight paid. Another instance in my own experience, also last season. One boat took to London on my account 372 cases of fruit, being forwarded by two different agents, in shipments of 210 and 162 respectively. The whole of this fruit was from the same garden, picked and packed at the same time, and of the same varieties, taken indiscriminately, and yet when the returns came to hand the 210 cases had realised £63 net, whereas the 162 cases were a failure, and after allowing for all expenses I was the loser of £2 19s. 9d., in addition to losing the fruit. The fruit had been landed in bad condition, and the selling agents were in nowise to blame; but this was also certainly the fault of the ship, and I was coolly informed by the owners that they could not entertain any claims for loss, as they had taken no responsibility, although the copy of account sales for the 210 cases were enclosed as proof of my statement. I do not mean to say for one moment that the shipping companies do not try their best to carry and deliver this cargo in good condition. The majority of it is delivered sound, but when it is shown that loss is caused by their carelessness, ullages, breakdown of machinery, or other preventable fault, it is contemptible for them to seek shelter behind their saving clauses in the bills of lading. We are told the same trouble and losses were experienced during the first two or three years of shipment of meat, butter, and rabbits; and after a time fruit will also be carried and delivered sound, and can be insured against deterioration during transit In the meantime we are the philanthropists at whose expense the shipowners learn their business. An even temperature of between 38 and 40 deg. should be a condition of the bill of lading, which could easily be proved by packing several self-registering thermometers in each shipment in several cases, such thermometers to be examined by a representative of the shippers at the other end, and in default the ship to be held responsible for losses. The Americans ship plums, peaches, and other soft fruits to Australia, via Sydney, some of which fruit I saw in Fremantle some twenty months ago, which must have been fully four weeks old since shipment from California, and yet was in perfect condition. This proves that even soft fruit will carry if properly treated and kept at the right temperature during transit. It seemed very wasteful to me, when watching the auction sales of grapes and pears from Spain in the London markets, to see any case a trifle overripe or a little damaged put up as damaged with all faults, and knocked down at from 2s. 6d. to 3s., whereas the same fruit looking sound would bring up to 15s. If those damaged cases had been sorted out and picked over there would have been fully 75 per cent. of perfectly sound fruit to sell, worth at least 10s., but simply because a little bruise or a few decayed grapes were visible the whole was practically given away. When it is considered that each case of fruit, in charges alone—that is, cost of case, packing, delivery f.o.b., and freight—costs at least 5s. 6d. laid down in London, it should be worth while [illegible]

[illegible] buyer is humoured and favoured in every way. We may reasonably expect a lower rate of freight for fruit carried in cool chambers, and, as all boats in this trade appear to have all their insulated space during the fruit season taken up—in fact, a lot of fruit cannot be shipped for want of room—it must be a very profitable cargo to the shipowners, who, in all fairness, should share some of the risks of safe delivery. Our agents also could assist us a great deal at the other end by having the fruit carefully examined and sorted out before it is submitted to public auction, and thus be able to variously describe the conditions of each case, and the buyers would know exactly what they were bidding for. The very small expense incurred would be more than balanced by the enhanced value obtained. Several circumstances are in our favour for the permanency and extension of our fruit trade with Europe. Firstly, the season at which we can land fruit, there being hardly any apples available in Europe during April, May, and June, and also the quality of Australian fruit compares very favourably with anything they can grow there or import from abroad. In conclusion, the shippers at this end, by sending nothing but suitable kinds, which are well known, free from grubs and disease, well packed, will be surprised at the quantity those oversea markets can absorb, and I am safe in saying that two million cases per season, properly distributed among the different centres would not reduce the selling price to any great extent. I think, however, that it is not only advisable, but almost necessary, that all fruit intended for export in the cool chambers should be chilled down to its proper carrying temperature, say, about 38 deg., before shipment. Considerable discussion ensued, and a vote of thanks was accorded to Mr. Knappstein for his paper. Members thought Mr. Knappstein's experience pointed to the absolute necessity for a representative Fruitgrowers' Association to look after the interests of the growers. Mr. Greenway thought that not only did they require an association at this end, but also representatives in Europe to handle the fruit on arrival and dispose of it to best advantage.

Reeves Plains, March 31.

PRESENT—Messrs. Oliver (chair), Folland, Richter, Wortel, Walter Day, and W. H. Day (Hon. Sec.), and three visitors.

DAIRYING.—Mr. Folland read a paper on treatment of cows on the farm. After many years' observation he had come to the conclusion that, as a rule, the cows on the average farm are treated in a very careless manner. Only recently he saw eighteen cows, "cow-frames" he would call them, crawling about a paddock looking for something to eat, and he could not help thinking that the crows sitting on the fence watching the cows looked far more hopeful of a meal. He admitted this was an exception, but the general rule seemed to be that almost anything was good enough for the cow, which seemed to be regarded as a necessary evil by many farmers. The best paddocks of feed, the best hay, etc., were all kept for the working horses, and what was not fit for them was considered good enough for the cow. The men on the farm are often foolish enough to regard the cow as an animal that did not work, and therefore did not require the same food a horse does. As a matter of fact, a good milch cow was always working, and it was very little rest her system got. It was no wonder so many farmers considered the cow unprofitable. He contended, however, that if given the best of food, treated kindly, milked regularly and carefully, the cow is a source of considerable profit to the farm. The farmer must exercise a little commonsense in sowing barley for early winter feed and sorghum for summer use, and in other ways treat the cow as a valuable piece of machinery to be kept in good order and condition. In spite of the opinions expressed by so many, he was certain that dairying, if conducted on proper lines, would pay equally as well in this district as wheat or hay growing at present prices without impoverishing the land to the same extent. His own experience bore this out. Usually he had nine to twelve cows in milk, seldom having any dry, as he found it paid better to feed them well and keep them in milk for 10½ to 11 months than to have them dry for so long as was the usual practice with farmers, as if the cows are to do their best when they come in they must be kept in good condition while dry. Last year, besides using plenty of milk and cream in the house, they made 3,312 lb. of butter. With twelve cows in milk last month their output was 400 lb. These cows were grazing in a paddock of sorghum, and received no dry feed. Now, however, they were getting bran and chaff, using 10 lb. chaff and 14 bushels of bran per week at a cost of 15s., while last week the return was 73 lb. of butter, worth £2 13s. 1d. At this season of the year they never expected to make much profit. One of his cows had been in milk eighteen months, seven others six months and over, while five were young heifers, in milk for the first season.

Koolunga, March 31.

Present—Messrs. Butcher (chair), Button, Sandow, Pengilly, Palmer, Butterfield, Buchanan, and Noack (Hon. Sec.).

Best Wheats for District.—Mr. Button initiated a discussion on this subject. He recommended Marshall's No. 3, which could be sown very early; Phillis Marvel, which, however, did not stand rough weather so well as the former wheat; World's Champion, an early variety, which could be fed off until the end of July without injury; Carmichael's Eclipse, Petatz Surprise, and King's Early, for quick-maturing varieties, to be sown late; Gamma, a good mid-season wheat. Mr. Pengilly recommended Marshall's No. 3 for early and Carmichael's Eclipse for late sowing. Other members generally supported Mr. Button. Queen's Jubilee was well recommended by Mr. Buchanan. Mr. Sandow reported that from 4 oz. of Marshall's Hybrid wheat, obtained four years ago, he had increased his supply to 200 bags last season.

Grading Wheat.—Mr. Button tabled samples of World's Champion wheat graded to four classes, and explained the method adopted. Members showed considerable interest in the difference in the samples.

Amyton, March 31.

Present - Messrs. Thomas (chair), Mills, Kelly, J. and W. Gum, J and A. Gray, Hughes, and Mullett (Hon. Sec.), and three visitors.

Business.—A programme of papers for discussion during the year was drawn up. An article describing the work carried out at the Minnesota Experiment Station in the crossing of wheat and the making of new varietie was read and discussed.

Wilmington, March 30.

Present—Messrs. Robertson (chair), Broadbent, Slee, Lauterbach, Sullivan, Noll, Bischof, Bauer, Schuppan, McLeod, Zimmermann, and Payne (Hon. Sec.), and several visitors.

Homestead Meeting.—Members met at Mr. W. Slee's residence. The orchard of ten acres, planted to various kinds of fruits, was first inspected The pruning of the trees, which are on low stems, with well-balanced branches, came in for special attention. The trees generally do well. The outbuildings, fences, and stock came in for careful inspection. Afterwards the visitors were entertained at tea. After formal business had been transacted the evening was devoted to social pleasures, and a hearty vote of thanks was accorded to host and hostess.

Membership.—Considerable discussion took place on proposal that the Council of Agriculture should make it a rule that one-third of the members of each Branch retire annually, instead of leaving it optional to Branches to adopt such a rule. Members feel that some provision must be made for the infusion of new blood in this way, the retiring members being eligible for re-election, but at the same time consider it useless for any one Branch to adopt such a rule.

Manures.—Members generally were of opinion that from 56 lb. to 70 lb. of super per acre was sufficient to apply in this district, where the rainfall was limited. Some discussion on pickling seed took place. Lime as a pickle was condemned by those who had tried it.

Morton's Summit, March 29.

Present—Messrs. Cowling (chair), Giles, Playford, Smith, and Osborne (Hon. Sec.), and four visitors.

Fruit Pests.—Considerable discussion took place on new Vegetation Diseases Bill, and it was decided to arrange for a public meeting of fruitgrowers at Ashton, to meet Mr. Quinn to discuss the various clauses.

Nantawarra, March 30.

Present—Messrs. Dixon (chair), Sleep, Greenshields, A. F. and E. J. Herbert, Belling, R. and J. Nicholls (Hon. Sec.), and one visitor.

Harvesting Grain Crops.—Mr. Sleep drew attention to satisfactory results secured at Roseworthy College Farm in harvesting crops with the binder and steam thresher. Members are of opinion that to attempt to harvest any considerable portion of the crop in this way on an ordinary farm would result in loss of grain in handling the crop when dry and brittle. Those members who have used complete harvesters during the past season reported that the machines handled the tangled and fallen crops much better than most makes of damp-weather strippers. It was generally considered that the stripper or harvester was the best machine for harvesting grain in this district.

Preparing Fallows for Seeding.—A discussion took place on the best implement to use in cultivating the fallows immediately prior to seeding. Mr. R. Nicholls considered this a very important question. His custom was to use a paring plough, with shares made extra wide, to ensure that all weeds are cut without going too deep. Shallow cultivation before seeding was essential to success. Mr. Sleep favoured the paring plough without the mouldboards. The spring-tooth cultivator was condemned by several members, but Mr. Herbert contended that this implement had many good points. Not only did it get over the land quickly, but, being light in itself, it can be kept at a shallow depth in light, trashy soils, which it was almost impossible to do with some implements. He admitted that it sometimes missed a few weeds, but he would rather this than disturb the seedbed. Mr. Greenshields agreed with Mr. Herbert.

Booleroo Centre, March 29.

Present—Messrs. Clack (chair), Nottle, Albinus, Repper, Steven, Murdoch, Brooks, and McMartin (Hon. Sec.), and two visitors.

Best Wheat for this District.—A discussion on this subject took place. The Chairman favoured Steinwedel and Sydney Purple Straw; Mr. Brooks, Sydney Purple Straw, and Smart's Purple as an early variety. Mr. Nottle also had splendid results with Sydney Purple Straw, and advocated more care in grading their wheat, using the best for seed, and securing a change regularly. The Chairman tabled first-class sample of grain reaped from second growth of wheat. Mr. Brooks thought good grain slightly affected by rust was better for seed than naturally small grain. Mr. Repper did not agree with previous speakers. Steinwedel and Dart's Imperial were preferable to Sydney Purple, and, as a mid-season wheat, he liked Budd's Rust-resistant. Mr. Murdoch also favoured Steinwedel, and had good results from Marshall's No. 3 as a mid-season wheat.

Hawker, March 30.

Present—Messrs. Borgas (chair), Hirsch, Wardle, Schuppan, O'Loughlin, Iredell, Lindsay, and Smith (Hon. Sec.).

Standard Bushel.—Considerable discussion on this subject took place, the question of payment for wheat over standard weight receiving attention. Mr. Lindsay referred to statement that wheat weighing 60 lb. to 62 lb. per bushel produced 40 lb. of flour per bushel. This was incorrect, as the wheat had first to be thoroughly cleaned, and when it went on to the rolls weighed 64 lb. per bushel. Bleached wheat did not make such good flour as sound, unbleached wheat, and was not worth as much to the miller. He thought permanent standards in three grades would be preferable to the present system.

Harrowing Growing Crops.—Mr. Borgas initiated a discussion on this subject. He had found his crops greatly benefited by harrowing them. Mr. Hirsch said his experience was the same, a considerable increase in the yield being the result. Mr. Wardle supported and urged farmers not to be afraid because they pulled up a few plants.

Swan Reach, March 26.

Present—Messrs. Baker (chair), Zadow, Brecht, Arnold, Fidge, Fischer, Haase, and Harris (Hon. Sec.), and two visitors.

Dairying.—The Department of Agriculture advised that no money was now available for the purchase of pure-bred bulls for the Branches. It was decided to enquire price of good Shorthorn bull, with a view to purchase.

Pickling Wheat.—Members consider it unnecessary to pickle early sown seed, but that sown after the first rains should always be pickled. It was decided to obtain formalin sufficient to pickle 100 bags of seed, to be sown side by side with wheat pickled with bluestone. Members consider the bluestone treatment destroys a good deal of grain, and, if as effective, would probably use formalin instead.

Balaklava, April 9.

Present—Messrs. Manley (chair), Anderson, Baker, Burden, Neville, Read, Robinson, Smith, Thompson, and Black (Hon. Sec.).

Wheat Experiments.—Mr. Robinson tabled following samples of wheat: —Majestic, grain hard and shrivelled, can only be recommended for experiment in this district; Silver King and Marshall's No. 3, both splendid samples, and strongly recommended for cultivation.

Sand Drifts.—Mr. Baker read a paper on "How to Prevent Fallow Land from Drifting." The land with which they were troubled was, roughly, of three classes: the sandhills, which he thought should not be fallowed unless under very favourable circumstances; the sandy loam, which gives the greatest trouble, and must be fallowed to clean it of weeds; and the light soils, of which the scrub land mainly consist, but which under ordinary circumstances give little trouble. The sandy lands should be fallowed about the end of June, as by that time, under ordinary conditions, the roots of the herbage turned under will have developed sufficiently to greatly assist in holding the soil together. Do not work the soil again until absolutely necessary, and then use the cultivator. The harrows should not be used, as they make the soil too fine. If it starts to drift, work with the spring-tooth cultivator, commencing on the windward side of the paddock: use six-inch shares, and go three or four inches deep, as the object is to leave the land ridgy. If cultivated too shallow there is not sufficient body in the ridges to hold the soil. wet working of sandy soil was always preferable to dry working. They must remember that one small patch of drift is sufficient, if neglected, to start the whole paddock moving. The farmer must not be afraid of the extra work involved, as the sand that drifts on to the roads is the cream of the land. During a wet summer like the present the surface of the soil is beaten down flat and smooth, and there is a greater tendency to drift. This, however, can be stopped by cultivating the soil as soon as the drift is noticed. Members generally supported Mr. Baker's statements.

Cattle Complaint.—Mr. Smith stated that he had lost several cattle from impaction. Those treated with a dry mixture of 1 oz. Epsom salts, 1 oz sulphate of iron, 1 handful of common salt, and 1 teaspoonful of carbonate of soda every morning for a time recovered. To give the medicine, hold up the cow's head and grasp the tongue, drawing it well out, then pour in the mixture, and give a little water to wash it down.

Clarendon, April 11.

Present—Messrs. Payne (chair), Spencer, Phelps, Pelling, Dunmill, Morphett, Harper, Juers, and Wright (Hon. Sec.).

Treatment of Cattle.—Mr. Dunmill read a short paper on handling and training cattle on small farms, in which he strongly recommended farmers to begin with the calves early, and by gentle treatment accustom them to being handled. If this is done they will also lead or drive quietly, and much trouble will be saved. Some discussion on the handling of stock took place.

Mount Pleasant, April 13.

PRESENT—Messrs. Phillis (chair), Lyddon, P. and T. Miller, Thomson, Maxwell, Tapscott, Drogemuller, and Vigar (Hon. Sec.).

HORSEBREEDING.—Mr. P. Miller initiated a discussion on this subject. He thought the Clydesdale the best horse for the farm, and at present prices would pay to breed. He thought many farmers did not let the foal run for long enough time with the mare. Buyers and breeders of good stallions needed some protection against the poor weedy beasts so often travelled. Most members favoured the Clydesdale, and did not care for the Suffolk Punch, which, in their opinion, was inferior, and would not fetch such good prices as the former.

Gladstone, April 2.

PRESENT—Messrs. Sargent (chair), Rundle, Gallasch, Inglis, McDonald, Brayley, Burton, and Wornum (Hon. Sec.), and one visitor.

PREPARATION OF LAND FOR SEEDING.—Mr. Brayley read a paper on this subject:—Whilst each farmer must be guided by local conditions of soil and climate, a very good system, and one now generally followed, is to fallow each year about one-third of the wheat-growing area of the farm. Preparing the land for seed should begin with the fallowing of the previous year, when the land is in the best possible condition for ploughing. The time of ploughing, and the condition of the land when ploughed, have most important effects on the result of the succeeding crop. The earlier in the season the fallowing is done, the better the results that follow. Late fallowing is generally done when the soil is in a half-dry condition, and is always rough and lumpy, and much more difficult to work to a solid seedbed. With early fallowing, sometimes two or more crops of weeds may be destroyed, and in a season like the present a team could with advantage have been kept working the fallow all through the season had other work permitted. The spring and summer cultivation of the fallow is an important factor in the preparation of the land for seed. The first cultivation of the fallow should be done before the soil gets too dry at the end of the season, when a good crop of weeds can at the same time be destroyed, the furrows well broken up, and the bottom or seedbed be more consolidated. If rough on top after cultivating, every advantage should be taken to break it down during the summer, by harrowing or rolling or both. He believed very strongly in the use of the roller in the preparation of the land for seed, and would always roll before the drill if possible. If the fallows have been well cultivated during the late spring and summer and kept clear of weeds, it should not, under ordinary conditions, require a great amount of labour at seed time, only the loosening of the surface two or three inches deep with a cultivator or other implement suitable. So far he had dealt with the preparation of fallow land, and he considered the farmer wise who depends on the fallows for his main crop. The cultivation of stubble or lea land is so uncertain in results that it is scarcely advisable to put in any great quantity each season. Farmers must stick to the fallows for the best results, and put in as little stubble as possible. The best way to cultivate the land.—The practice adopted by a great number of farmers in ploughing is either to plough all around a paddock, or else cut it into two or more blocks, and plough around each block. This is not so bad as regards the ploughing generally if the land is well scarified across afterwards, but ploughing this way renders the land more difficult to crosswork it all. He had seen paddocks worked this way every time they were ploughed, generally the longest way, and at seedtime the land is scarified the same way as ploughed, the seed is drilled the same way, and all the cultivation the land gets is done, one implement after the other, working the same way. The only parts that are crossed are the short pieces at the ends. He could not agree with this system of working the land. The old way of ploughing in lands, working the paddock one way one time and crossways the next, was better. By this means the cultivating implements can always be worked across all the furrows, and all ridges and pieces that might be missed by the plough are more likely to be broken or cut up. He cross-cultivates, if possible, every time, whether it is scarifying, harrowing, or drilling, and was sure by doing it this way a greater number of weeds are killed than can be done by cultivating the land one way only. If there are many weeds growing at the time of seeding, a good plan is to scarify always a block ahead of the drill, which can easily be done by starting two or three days or a week before starting to sow, and then drill the seed across the scarifying, as the drill itself gives the land a fairly good stirring. Harrowing again after the drill is advisable, as with them the crop seems to come on better, and the wheat is better covered. The chief points that should be followed were a good ploughing at the right time, well working of the fallows during the spring and summer, keeping the land clear of weeds, getting the soil to a nice, fine tilth on top, with a good solid seedbed underneath, and the judicious use of suitable manures drilled in with the seed under favourable conditions.

Stansbury, April 9.

Present—Messrs. Sherriff (chair), Flaulkner, Anderson, Humphries, Henderson, Antonio, and Cornish (Hon. Sec.).

Fruitgrowing.—It was decided to endeavour to arrange for demonstration in fruit-tree pruning by Mr. G. Quinn, a pruning match, and a trial of farm and garden cultivators during the winter.

Quorn, April 2.

Present—Messrs. Thompson (chair). Finley, Patten, McColl, Cook, Venning, Brewster, Smith, Noll, and Walker (Hon. Sec.).

Dairying.—Mr. Venning initiated a discussion on dairying. Even under the old system, farmers who looked after the cows properly found dairying a source of profit. The introduction of the separator had increased their returns 30 to 40 per cent. from the same quantity of milk. From seven cows he was now making 30 lb. of butter per week, of better quality than he made when the pan-setting system was followed. The fresh skim milk was very useful for calves and pigs, but he advised removing the froth which formed on the top. Mr. McColl said with even three cows he found the separator a great benefit. The Chairman said where farmers set their milk in pans the dairy should be warmed in winter by means of pipes carrying hot air from a small stove.

Burra, April 15.

Present—Messrs. McDonald (chair), Flower, Goodridge, Field, Heinrich, Arnold, Needham, and Harvey (Hon. Sec.).

Comparison of Old and New Land.—Mr. McDonald read a paper on this subject. Any one who has compared old wheat land with virgin soil in this district will have noted that in texture and in many other ways there is a marked difference in their character. Where the land is cultivated the particles of soil are more closely packed together, and there is consequently less air space between them. As a result the soil seems to lose some of its power of absorbing and holding moisture; its temperature varies more, being colder in winter and hotter in summer. The grazing and wheatgrowing capacity of the land appears to decrease: the latter more than the former, as the deficiencies in texture can to a large extent be overcome by good tillage. This change appears to be the result of the gradual destruction of the organic matter in the soil after years of cultivation, and the remedy naturally is to retore the organic matter to the soil if it is practicable or profitable to do so; if not, the farmer must remain content if he can keep up the present standard of fertility. He thought, however, that it would pay them to make an effort to increase the organic matter in the soil, as the fertile soil will give the greatest amount of early feed, will require a less amount of labour to fit it for the wheat crop, besides which there is the greater certainty of high yields. In European countries the organic matter is replenished by green manuring and by the use of farmyard manure. In their dry district the former was not possible, and the amount of farmyard manure available would go but a very little way. He thought they should resolutely set their faces against the burning of stubble land and the growing of a second cereal crop after the fallow. This would necessitate grazing the stubble paddock, and give a three-year course, viz., fallow, grain crop, grass. After the stubble has been lying on the land for nearly eighteen months, it will all be broken down and rotted or trodden into the soil, and the land can be fallowed without inconvenience from the straw. By this practice they provide a good deal of useful feed for stock for two or three months after harvest, splendid cover for the land, and the young feed in autumn and winter, and help to restore organic matter to the soil. Light stocking was necessary, so that there was always a cover of grass on the land. This would, of course, mean a slight loss of income for the first year or two, but in the end the farmer would be the gainer. It is usually considered waste to plough under a good covering of grass, but he considered it economy to do so, as generous treatment of the soil was the policy that paid best in the long run.

Whyte-Yarcowie, April 16.

Present--Messrs. Hack (chair), Makin, Kornetzki, Faul, Lock, Jenkins. Dowd, Francis, Pearce, and Boerke (Hon. Sec.).

Stones and Fertility.—Members were unanimous that small stones, especially limestone, were beneficial in the soil, and increased its productiveness. An instance was given of a farmer near Yongala who years ago removed all the stones he could gather from his fields, and found he could not grow such good crops as formerly. He then carted the stones back, and spread them on the land, and found that the crops benefited.

Standard Bushel.—Members were of opinion that this should be the Imperial bushel of 60 lb., and should not be varied each year. The system of docking wheat under the standard was considered too severe.

Euphorbia Poisoning.—It was stated that the lives of sheep poisoned by eating Drummond's spurge (Euphorbia Drummondii) could be saved by bleeding under the eye or ear.

Mount Compass, April 9.

Present—Messrs. Jacobs (chair), Hutton, Slater, Arthurs, DeCaux, and Good (Hon. Sec.).

Business.—Mr. Good was advised to use sulphur in the spring for disease on vines. Mr. Slater stated that those who partook of the fruit from his fig tree became sick, and he wished to know whether the fact that it was growing near a plant of Fourcroya or that it received the soapy and other waste water from the house would affect the fruit. Discussion took place on proposed railway from Aldgate to Cape Jervis, and it was decided to arrange for formation of a committee to work with other districts.

Yorketown, April 9.

Present—Messrs. C. Anderson (chair), J. and A. E. Anderson, Bull, Sabine, Davy, Jung, Domaschenz, and Newbold (Hon. Sec.).

White Heads in Wheat.—Mr. Bull initiated a discussion on this subject. White heads were very prevalent in a portion of his crop last season, and he was of opinion that it was mainly due to dry ploughing, the land being broken up rough and cloddy. This was supported by reports from other parts of the State. Lack of moisture at the critical time would result in the wheat going off prematurely. Other members had not much experience in white heads, but their views tended to confirm Mr. Bull's opinion.

Best Wheats for District.—This subject was discussed at length. Gluyas is generally regarded as the best early wheat, while for later kinds Marshall's No. 3 and Silver King were unanimously voted superior to other varieties grown in the district.

Crystal Brook, March 26.

PRESENT—Messrs. Pavy (chair), Townsend, Dabinett, Hutchison, Venning, Davidson, Hamlyn, Weston, Morris, and Symons (Hon. Sec.).

CO-OPERATION.—Mr. W. J. Venning read a paper on the benefits of co-operation, pointing out the advantages of co-operation in general, and the special value of the South Australian Farmers' Co-operative Union in particular.

Colton, April 9.

PRESENT—Messrs. P. P. Kenny (chair), M. S. W. Kenny, Whitehead, Hull, Andrew, Kleeman, McCracken, and Packer (Hon. Sec.)., and one visitor.

QUANTITY OF SEED TO SOW.—The Chairman had best results from sowing one bushel per acre. Mr. McCracken generally sowed about a bag to five acres. Members would like the opinion of members of other Branches on this subject.

MANURES.—Discussion took place on most profitable quantity of manure to sow per acre with 16 inches rainfall. The splendid growth of herbage following wheat crop manured with phosphates suggests to members that more manure was applied than the crop could use. If too much or too little manure is applied, the farmer is at a loss.

Port Elliot, April 16.

PRESENT—Messrs. McLeod (chair), Wickman, Welch, Green, Basham, Pannel, Inglis, Hutchinson, and Hargreaves (Hon. Sec.).

MIXED FARMING.—The Chairman read a paper on lessons to be learnt from rusty seasons. The first was to sow only proved rust-resisting wheats, and these of the best kinds. In this connection they must not forget that they had to compete in the world's markets, and consequently must produce the best quality grain. The second lesson was that they must not have all their eggs in one basket. Instead of only growing grain and hay, they would have to pay more attention to dairying, sheep, poultry, and fruit. In dairying, many of them had paid dearly for their experience. They had treated dairying as they formerly farmed, i.e., taking all and giving nothing. Overstocking and insufficient attention had been at the bottom of their losses. They had now learnt to keep fewer cows, to grow summer feed, and, failing this, to use bran and chaff, and the results had been satisfactory. Although the price of butter was not so high as usual, there was still a fair margin of profit. especially if the work could all be done by the family. Then the rearing of calves was a source of profit. Instead of killing them, as so many used to, they were reared and sold either for veal or to dealers, and some were kept to replace the old animals in the herd. Where calves are not reared, however, the skim milk can be profitably utilised in connection with pig-rearing. Where large enough, a few sheep should be kept on the farm, both for meat for killing, and also for rearing lambs for the export trade. There was good money in this business. He favoured mating Shropshire rams to large-framed Merino ewes. Always bear in mind that, as with other stock, so with sheep—the better the parents the better the progeny. Farmers were now paying more attention to poultry, and he was convinced that with proper management they paid well for the money and labour involved. Then in this district there was a lot of land admirably adapted to the growing of apples. He knew some would talk of over-production and codlin moth; but he did not think they need attach much importance to either of these. Of varieties suitable for export there was no over-production, as prices paid by packers proved. With a slight reduction in cost of sending to Europe they could largely increase their export trade, and the prices realised would make apple-growing profitable. It had been demonstrated that the codlin moth could be dealt with, and most of the fruit saved without undue cost. Most of the members agreed with the paper. Reference was made to a statement in the newspapers that a man near Balhannah had dug 22¼ tons of Sensation potatoes off less than two acres of land.

Elbow Hill, April 5.

Present—Messrs. Wills (chair), W. and J. Ward, A. and W. Spence, Hay, Elleway, Robertson, and Dunn (Hon. Sec.), and four visitors.

Poultry.—Mr. W. Spence read a paper on "Will Poultry Pay?" He was sure fowls paid well if properly managed. The first thing is to select the right breed. As egg production will be the most profitable branch for the farmer, he recommended White Leghorns. They were hardy, good foragers, good layers, and came very early to maturity. It would be necessary to keep a few heavier fowls for sitting, as the Leghorns were non-sitters. Fowls must be fed regularly, and in winter should have a hot feed in the morning. He found boiled wheat mixed till thick very good. Clean, fresh water must be provided daily: the houses must be cleaned out at least twice a week; and care taken to keep the houses and the perches free from vermin. In the summer it was a good plan to put a little lime in the water twice a week. Where a general purpose fowl was profitable, the Minorca, crossed with some of the well-known table strains, would be profitable. Considerable discussion ensued. Mr. Ward stated that at present prices for eggs wheat fed to fowls would fetch a return of 6s. per bushel. More attention should be paid to poultry in this district. Most of the members favoured the White Leghorn for this district. A discussion on tick in fowls took place; but most members stated that it was not known in the district.

Cleaning Wheat.—One member stated that it was his experience that it did not pay the farmer to clean his wheat thoroughly. If he puts the wheat through the winnower twice, or slowly enough the first time to make a first-class sample, he has more screenings and less marketable wheat than if he only cleans sufficiently to reach the f.a.q. standard. He not only gets no payment for his labour, but is actually out of pocket. If, however, the buyers would pay more for over-standard wheat, there would be some inducement to the farmers to try to raise the reputation of our wheat.

Farming Mallee Land.—Some discussion on this subject took place, the experience of members being that under ordinary circumstances the best cultivated land yielded the most profitable returns; but the Chairman held that the cheapest way of getting the crop in on mallee land was the most profitable.

Mount Remarkable, March 31.

Present—Messrs. Challenger (chair), Jorgensen, Kaerger, Giles, Casley, Yates, McIntosh, Morrell, and O'Connell (Hon. Sec.).

Noxious Weeds.—The Hon. Secretary read article from *Journal of Agriculture* on this subject, and considerable discussion ensued. All agreed that members of the Bureau throughout the State should keep a careful lookout for any new weeds, and do their best to have them destroyed before they spread over any considerable area of country.

Richman's Creek, March 28.

Present—Messrs. Freebairn (chair), F. H. and J. H. Lehmann, McSkimming, Gebert, Knauerhause, H. and J. M. Kelly (Hon. Sec.), and one visitor.

Water Conservation.—Mr. H. Kelly read a paper on "Our Water Supply." The past five or six years of drought had caused inconvenience and loss to many farmers in the dry areas, and some remarks on the best way to obtain a permanent supply of water might be of interest. Where a good supply by means of wells can be secured they did not desire anything better; but it was very difficult to get such a supply by sinking wells, and most farmers could not afford the cost of boring for artesian supplies, which were said to exist beneath the soil in this and surrounding districts. They must therefore depend upon surface water caught in tanks and dams. Underground tanks should in all cases have dry clay well rammed behind the walls to prevent the water escaping, should the cement or concrete crack. If possible, make the tank on the higher side of the house, as it will be found most convenient there. Before making a dam the site must be carefully selected and the ground tested. If in clay, a 1½-in. auger on an 8-ft. iron rod will test the ground to that depth; in stones or gravel formation, a trial hole must be sunk. The size of the proposed dam and the gradient of the slopes must also be considered in selecting the site. Where stock have to water at the dam it is a common mistake to have the slope too steep. This not only causes more rapid silting up, but weak stock get bogged. If the dam is fenced, and the water drawn from it, make the banks as steep as possible; but otherwise, the slope at which the stock water should not have a greater fall than 1 in 6. Advantage may be taken of a creek on which to build a dam, and in this case, before making the bank, a trench about 2 feet wide should be put down to the clay or subsoil, which should be loosened before the clay is rammed in for the puddle core to the bank. The bank may be extended to rising ground on both sides, making a dam across the creek, in which case a by-wash must be made on one side about 3 feet lower than the top of the bank. A silt dam should be constructed about a chain or so above the main dam, with a trench connecting the two. Drains should be made to convey water from the catchment area to the dam. Levels must be taken to determine where the drains shall go; but this is a very simple matter. Some discussion ensued. Some members considered the slope of 1 in 6 not sufficient, as there would be a greater surface exposed to evaporation; a fall of 1 in 3 was suggested by Mr. Wright as sufficient.

Kapunda, April 2.

PRESENT—Messrs. Shannon (chair), Flavel, Morris, Hackett, Weckert, Banyer, O'Sullivan, Teagle, Kerin, and Harris (Hon. Sec.).

PIG-BREEDING.—Mr. Banyer read a paper on this subject prepared by Mr. C. B. Domeyer, of Moppa.—During the past 35 years he had had considerable experience with pigs—as a breeder, dealer, and preparing the hog product for consumption. During that time he had to do with all breeds and conditions of pigs. He found the first cross pig of any breed the most vigorous and profitable, and the black breeds much hardier than the white. To be fairly successful, a pig-breeder must be a specialist: that is, either breed for porkers or bacon pigs. The porker ought to be in ripe condition at about 70 lb. weight dressed; and the light baconers, 120 lb. weight dressed. These are the most profitable pigs to produce for Australia. The farmer who lives a long way from market will find the light bacon pig the most profitable if he understands bacon-curing. Should he have porkers, they will lose enormously in weight and appearance if they are many days in transit. On the other hand, the man near main markets will find the most money in porkers; and as pigs of about 70 lb. are always the highest in price [illegible] on the one hand, and cost about ½d. per lb. less to produce than the [illegible] will be his special line. To breed porkers use a pedigree Essex boar, and put him with a crossbred sow possessing the size, qualities, and general characteristics of the Essex, with strong loins. Do not use a large, roomy sow for this purpose, or some of the young pigs will be weak in the back and be badly developed in the ribs. For baconers to mature at 120 lb. weight, with a large proportion of tender, lean meat, he would prefer a pedigree Berkshire boar showing great strength of carcase. Usually this type is very coarse in the head, and as very early maturity is wanted, he should be from 8 to 15 months old, and not older. The sow can be a crossbred of any breed, and should be bred to very young. After rearing the second litter, she should be disposed of. The sow should be long, with straight hams, and inclined to be rather long and fine in the face. If ears show on the coarse side, it will be all the better. His experience in keeping pigs has been by having them in yards or paddocks. When they keep pigs shut up they must be fed, and a big item is the wages account; therefore, study labour all the time, and keep the cost of labour down, not by cutting wages, but by economical contrivances to save labour. At present he had 18 breeding sows, a boar, and eight weaners; the cost of labour for all attendance being 7s. per week. The pigs were fed morning and evening, and watered three times each day. Everything had to be carried. Pigs should not be kept on swamps, marshes, or wet land, as under these conditions they are subject to various diseases, etc. For fencing the paddocks any ordinary posts, 10 feet apart, 3 wires, and 3 ft. 6 in. rabbit netting, will do. Bore top hole in fence 3 ft. 8 in. from level of ground, middle hole 2 feet from ground, and bottom hole in strainers only, 3 inches under level of ground. Make a gutter 3 inches deep along line of fence; fit the netting to top and bottom wire, with 4 in. pieces of No. 14 galvanised wire. Do not use the rings sold for this purpose, as they snap off with sudden strains. Then have a man with lever to force bottom wire down in drain at each post, while another nails wire and netting to bottom of post with a 3-in. nail, turning head of nail down over wire. Now fill drain and ram all along line of fence, then tie netting to middle wire. If the pigs' noses were ringed and they were well fed, this fence would keep in any pig. Large troughs for pigs were dangerous, more particularly when one trough is used for food and water, especially when cooked or soaked and sour food is given, as it is very hard to keep them free from injurious ferments. To provide 18 pigs with water he used two kerosine tins opened on the flat side and let in the ground. Around them he had stones let in the ground, and also strong stakes projecting about 4 in. above ground. The pigs walk over the stakes to drink, but cannot comfortably lie down on them, consequently the water is not polluted. To keep pigs free from vermin they must have mud baths. He had one in the paddock 12 ft. by 12 ft., and 2¼ ft. deep. This is kept full of sticky clay, and by adding a few buckets of water every day the mud is kept fluid. Once each week he put into the mud bath one kerosine bucketful of slaked lime, one kerosine bucketful of ashes, and 3 lb. of sulphur. This bath is cleaned out once each month during summer and fresh clay used. He always kept a heap of fresh ashes in the paddock, and for shelter had galvanised-iron sheds, and had bush root sheds for the pig to be under when it is hot. To provide food for the pigs last May, after ploughing, he sowed by hand five bags of 36 per cent. super in paddock No. 1, containing about 5 acres. Rye was then sown thinly and harrowed in, after which 6 lb. per acre of lucerne was broadcasted. No. 2 paddock contains 7 acres, and kept 7 pigs from May 10 to June 12, when 6 pigs were added. These were all breeding sows. They had no food but the grass in the paddock until the middle of November, and kept in good condition. No. 3 paddock, 9 acres, was ploughed in May, 7 in. deep, with single plough, and left rough for a few weeks, then worked as often as possible until September 20, when 2 cwt. of superphosphate per acre was applied. Two acres were planted to Jersey tree kale, 3 acres to amber cane, 1 acre maize, 2 acres culinary vegetables. Last week the two acres of kale was dressed with 8 cwt. of super, 36 per cent. Another part of the paddock had 2 cwt. applied, and sowed to rye and rape and broad-leaved mustard, and as other crops mature would manure heavily and sow to crop for early winter feed. As he expected to have 150 pigs in the early winter months, besides the 18 sows and boars to feed, he would have to push on with the fodder crops. But, heavy manuring, combined with deep ploughing, in fact, was the secret of heavy cropping. They need not be afraid of the poor, cold subsoil if they manure heavily; that is, for summer crops to be followed by early winter cropping. For summer crops everything should be planted in rows 4 ft. apart, and horse hoed with the plant cultivator twice each month if it rains or not. [illegible] the different varieties of summer fodder for the pigs he found maize, [illegible] the cob appears, is the best, Jersey tree kale next, amber cane next. At present he had in paddock 13 breeding sows and 1 boar and gave them Jersey tree kale and amber cane as much as they clean up, and 14 lb. wheat per day. Pigs keep in good condition on the ration. Five sows in the yard got amber cane and kale the same as paddock pigs but instead of wheat they got 5 lb. copra cake and 5 lb. of pollard each day. These sows were expected to have young the first week in April, therefore the ration differed from paddock ration. The week before littering he adds ½ lb. of fine bone meal to each, mixed up in stiff pollard. Salt and ashes are given to them in their food every day. He had found the pig at times a profitable animal; but he requires food, and if, owing to failure of crops or other causes, the feed is done, sell out at once. If the bulk of the feed has to be bought for six months in the year, the pig will eat up your banking account.

Hartley, March 25.

Present.—Messrs. Brook (chair), Reimers, Pratt, B. A. and A. A. Stein, Hassam, Jaensch, and Fry (Hon. Sec.).

Dairying.—Discussion took place on best breed of dairy cow. Mr. Pratt found the Shorthorn cow the most profitable, although the milk was not so rich as that of some breeds. Mr. C. Brook had tried the Ayrshire-Shorthorn cross, and was not satisfied with the result. It was unanimously resolved that the Shorthorn was the best cow for dairy purposes for this district.

Strathalbyn, April 19.

Present—Messrs. M. Rankine (chair), W. M. Rankine, Meikle, Fischer, Reed, Cockburn, and Cheriton (Hon. Sec.).

Conference. — Papers read at recent Conference were discussed at length, and the following resolutions carried: —"That in the opinion of those present, Mr. Caldwell's views on the prospects of the dairying industry under federation are sound and to the point; and, further, we do not think South Australia will ever be a dairying country;" "that too much has been made of the bugbear of bleached wheat by buyers, to the loss and annoyance of producers;" "that the hand separator is a boon of great value to dairymen living at a distance from a factory; but we strongly object to its general use, for the reason that, as a State, we shall be unable to compete in the world's markets, owing to lack of uniformity in our butter, which cannot be maintained while made from all classes of cream supplied in small quantities to the factory."

Carrieton, April 26.

Present Messrs. Gleeson (chair), Kaerger, Cogan, Harrington, Vater, O'Halloran, Fisher, and Bock (Hon. Sec.).

Membership.—The majority of members approve of change in membership rules, as suggested by Wilmington Branch.

Exhibits.—Mr. Kaerger tabled sample of wheat nearly ripe, second growth of lucerne, lettuces, tomatoes, melons, and other vegetables, grown by himself.

Dairying and Poultry.—The Hon. Secretary read a paper on dairying and poultry farming in the North. He held that these two industries made a splendid stand-by for farmers where the wheat crop fails, and in this most members agreed.

Narridy, April 16.

Present—Messrs. Satchell (chair), Darley, Kelly, Smallacombe, Smart, Turner, Freebairn, Nicholls, Dixon, and Dunsford (Hon. Sec.).

Horsebreeding.—An interesting discussion on this subject took place

Mallala, Ap[illegible]1.

Present - Messrs. McCabe (chair), Marshman, Wilson, Loller, Nevin, Worden, S. and W. Tomby, East, Moody, and Stephenson (Hon. Sec.), and one visitor.

Co-operative Header. Mr. J. McCabe read a short paper on the header and its value. The general use of manures and the seeddrill had been the means of producing heavier crops of grain, and it required the adoption of a more practical system to harvest the crops to the best advantage. Their aim must be to secure the greater part of the crop against risk of damage by storms when ripe, and to preserve the straw in its best condition for fodder for stock. He suggested the formation of syndicates of farmers in different districts to purchase a header with a six or eight horse-power portable oil engine. It would take nine men to work the plant, and to save trouble on the farm portable cooking appliances should be provided. The farmer would cut [illegible]

[illegible] be shifted from farm to farm, and would be employed for about three or four months. The charges would vary according to the quantity treated on each farm. A large stack could be threshed at a cheaper rate per bag of grain than a small lot. Mr. Stephenson said he had strongly advocated the adoption of this practice for several years, and was sure that one or two more seasons like the past would lead to the general adoption of the header. Not only did they run less risk of [illegible] in the standing crop, but the straw was a valuable asset, and he was convinced that a large number of stock could be kept if the straw was saved in good order. In Europe straw formed a considerable portion of the ration of stock for several months in the year. Several members expressed doubt as to the successful working of the proposed syndicate, but they were prepared to make use of a travelling plant if one were available. Mr. H. B. Moody reminded members that he and his brother harvested the whole of their crops with binder and header, and, after several years' experience, they had no desire to change their methods. If he had been prepared to do so, he could have worked his machine for other farmers for fully four months. If he had undertaken that work he would have been compelled to neglect other duties. Mr. McCabe pointed out that it was impossible for a farmer to go the round of the district with his header without neglecting necessary work on his farm. Besides this, so many men were required that if they were boarded by the farmers it would entail too much trouble on the womenfolk. In addition to this the cost, about £300, was too heavy. He could see no reason why a syndicate could not be formed to buy and run the plant, and was prepared to put £20 into it himself.

Port Pirie, April 25.

Present—Messrs. Wright (chair), Johns, Teague, Humphris, Smith, Crispin, and Wilson (Hon. Sec.).

Membership.—Suggested change in membership rules submitted by Wilmington Branch were unanimously approved.

Formalin for Pickling Wheat.—A discussion on use of formalin in the place of bluestone as a preventive of smut took place. Members thought that owing to it being necessary to leave the seed in pickle for five minutes the seed would have to be dried or else sown the next day, as the immersion for five minutes would soften the grain too much.

Standard Bushel.—Members, while admitting that the small scales used by wheatbuyers in testing the weight of wheat were objectionable, doubted whether larger measures would prove more reliable, while they would undoubtedly cause extra labour and expense.

Time is Money.—Paper read at Onetree Hill Branch on this subject was discussed and considered to contain many very useful hints.

Gum[redacted]ha, April 15.

Present—Messrs. Morri[redacted]), Jamieson, Moore, Norsworthy, Hanna, Bond, Stephens, Foote, and (Hon. Sec.), and one visitor.

Vegetation Diseases Bill.—The proposed new Bill was discussed at length. Fruitgrowers strongly oppose the provisions of the Bill, and it was decided to ask Mr. Quinn to meet growers to discuss the measure.

INDUSTRY.

SUPPLIED BY THE DEPARTMENT OF INDUSTRY.

Labor Bureau.

Number of persons registered and found employment by Government Departments and Private Employers from March 25 to April 28, 1904

Trade or Calling	Number Registered.		Number Employed.
	Town	Country.	
Laborers and youths	43	52	316
Carpenters	—	—	4
Masons and bricklayers	1	1	1
Painters	2	—	1
Blacksmiths and strikers	1	—	1
Enginedrivers and firemen	—	1	1
Compositors	1	—	—
Apprentices	12	2	2
Cleaners	1	—	—
Porters and junior porters	3	1	2
Rivet boys	5	—	2
Totals	69	57	330

April 29, 1904 A. RICHARDSON, Bureau Clerk

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THE PROFITABLE EXTRACTION OF ALCOHOL FROM PRESSED GRAPE HUSKS.

By ARTHUR J PERKINS, SECRETARY FOR AGRICULTURE.

[Paper read before the S A Vinegrowers' Association, on May 25, 1904]

INTRODUCTORY.

The subject matter of the present paper—the profitable utilisation of certain important vintage residues—is I trust, of a character to attract the attention of some of our winemakers. In these days a mere statement to the effect that the success of the manufacturer or the producer is mainly dependent on the extent to which he is able to cheapen production deserves little more than the smile of recognition usually bestowed upon a common truism The discussion, on the other hand, of any of the means that lead up to this object constitutes, I hold, a question otherwise important The more obvious road to this end, the one, in fact, that is first availed of, leads for the most part to a reduction in the labour bill by the adoption of improved labour-saving devices It is thus that in our cellars mechanical crushers have superseded the feet of the grape-trampers, and, whenever possible, the siphon the arms of the man behind the pump It has led, too, to the accumulation in a limited number of large cellars of an enormous amount of produce, which, in older times, would have [illegible]uted over innumerable small ones It is equally apparent that th[illegible]lete utilisation of the products that are handled must, in like m[illegible]bute materially towards the attainment of this goal of modern m[illegible] I fear, however, that this essential aid to ultimate success has [illegible]mes received in our cellars the attention that it can justly claim [illegible]es are cheap and profits on wines high, the existence of a certain am[illegible] carelessness in this direction is readily accounted for, though not necessarily excusable, and it remains, perhaps, for times of stress to bring home the lesson that at no time does profusion constitute a valid excuse for waste in any form. I have, however, no intention of treating to-day the question in its more general bearings, nor even of drawing attention to all points in which I deem avoidable waste to exist It is my purpose to deal exclusively with what, in certain circumstances, appears to me the most profitable means of turning to advantage the grape husks as they leave the presses

Let me state at the outset that I am very far from labouring under the delusion that in all our cellars the pressed husks (or marc) are allowed to disappear from the presses and cellars in pure waste. The man who applies them to his land in the form of manure is turning them to some advantage, indeed, weight for weight, they may in this direction be looked upon as the equivalent of good farmyard manure All, however, are not in possession of available land to which the husks could be applied with advantage, whilst others aware of the economy with which concentrated artificial fertilisers can be distributed over the soil, hesitate, much to their own loss, in my opinion, to undertake the somewhat expensive handling of bulky fertilising material in the form of husks A few, again, following in the footsteps of the beet sugar manufacturers of Europe, find in these vintage residues useful foodstuff that can be fed advantageously to various kinds of live stock. The latter practice, which, after more complete disintegration by the digestive organs of live stock, leads to the ultimate utilisation of the husks as manure, is unquestionably in advance of their direct application to the land. Neither practice, however, renders avoidable the waste of a substance of considerable economic value, viz., the *alcohol* which the pressed husks retain in varying proportions: and it is because I believe that in many cellars the latter can be profitably extracted, without appreciably reducing the value of the husks for ulterior purposes, that I propose discussing to-day the best methods whereby this extraction can be effected.

AMOUNT OF ALCOHOL RETAINED BY THE HUSKS.

Before dealing with the methods in use for extracting the spirit, let us first endeavour to form some idea of the amount retained by the husks as they quit the presses. I shall, in the first place, deal with this question from the purely theoretical aspect, with a view to drawing attention to the apparently unavoidable losses that arise in ordinary practice. The figures that I shall use have reference to the 1904 vintage at the Roseworthy College, during the course of which fairly accurate data were collected. The red grapes received at the cellar amounted to 34.662 tons, equal 34 tons 13 cwt. 0 qr. 25 lb. From laboratory estimations made it was ascertained that the fruit could be made to yield 80 per cent. of its weight in juice of a density averaging about 1,100. This would represent about 163 gallons to the ton, weighing each about 11 lb. It is evident, however, that it does not follow that what can be extracted by laboratory methods can in a like manner be extracted by the methods of ordinary practice. In fact, it is matter of common experience that such cannot be the case, nor was it so in this special instance Owing to the fact that the husks were not taken out to the presses until after they had undergone a second fermentation with an older wine to which it was desired to add body, there has been some difficulty in arriving exactly at the number of gallons to the ton that were actually collected. On an estimate that is more likely to be below than above the truth, it is assumed that each ton of red grapes averaged 142 gallons of wine, testing 13 per cent. of absolute alcohol, or 22 2-5ths per cent. proof spirit. Between 163 gallons, the amount inferred theoretically to be available in the fresh fruit, and 142 gallons, the amount actually collected, there is an apparent loss of 21 gallons per ton of fruit, which we must assume to have been retained by the husks. Now, each gallon thus lost represents 22.78 per cent. of proof spirit; hence the spirit in the 21 gallons retained in the husks of a ton of fruit was equivalent, roughly, to 4 4-5ths gallons of proof spirit: or, 166 gallons for the 34.662 tons of red grapes picked. Theoretically, therefore, in the special case under consideration, the husks of each ton of fresh fruit carried away from the presses [illegible] form of spirit value to the amount of 15s. to 16s.—a sum not to be de[illegible]ould it be profitably reached.

It was, however, advisedly that I said that such calculations rested mainly on considerations of a theoretical nature, not realisable in the range of ordinary practice. I had at one time hoped to be to-day in a position to supply you with accurate data concerning the amount of spirit actually observed to have been removed by the skins during the late vintage at Roseworthy, by comparison with the amount theoretically inferred to have been removed. I had, in fact, laid out my plans accordingly: but, unfortunately, in the hurry of the vintage, events appeared to conspire against the object I had in view, and I cannot claim for the figures I succeeded in collecting the accuracy that I could have wished. Altogether too late in the season, too, the thought occurred to me that useful averages, agreeing with the ordinary practice of the State, could be secured by collecting from different cellars average samples of the husks in the condition they leave the presses. In this direction, at all events, I trust to be in a position in 1905 to push the enquiry to more conclusive end.

The figures that are given below represent the results of a series of attempts to determine the actual amount of spirit in samples of husks by direct distillation of the latter. The great irregularity of these figures considerably weakens their claim to accuracy. Such as they are, however, I am compelled to use them, trusting that on the average they will approach the facts sufficiently closely for our purpose. I may state here that the main difficulty of the operations was connected with the comparatively large bulk of skins that had to be distilled.

TABLE I.

Distillations.	Litres of absolute Alcohol to the Ton of Pressed Husks.	Gallons of Proof Spirit to the Ton of Pressed Husks.
1	35·328	13·627
2	21·342	8·232
3	12·195	4·702
4	10·071	4·116
5	26·118	10·074
6	85·357	32·924
Average	31·835	12·279

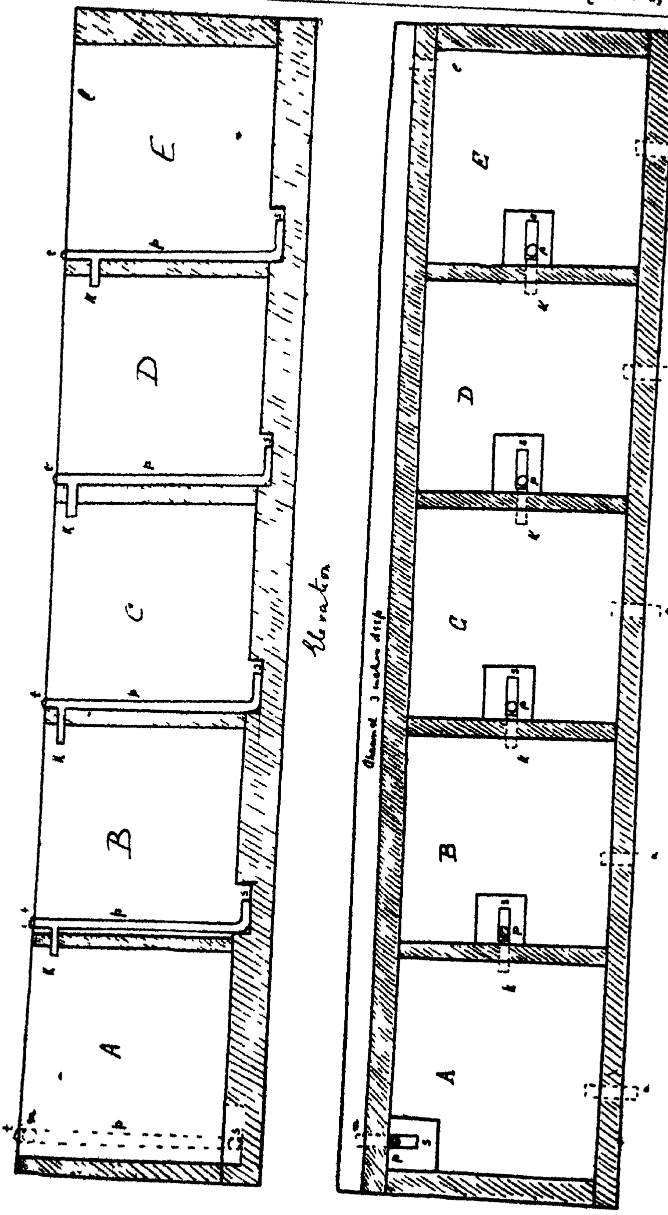
We have, therefore, slightly over 12¼ gallons of proof spirit per ton of pressed husks; and this figure, the absolute accuracy of which is open to doubt, may be taken as probably below the truth than above it. We found, on the other hand, by actual weighing, that the husks of 34.662 tons of fresh fruit had been reduced to 5.942 tons (most of the stalks had been removed by the separators). This figure therefore brings up the amount of spirit that was apparently available in the husks to (5 942 × 12.279), approximately, 73 gallons of proof spirit, which is considerably below the 166 gallons inferred theoretically to have been present. It should not be forgotten, however, that owing to inaccuracies of estimation 73 gallons is probably below the amount that was actually present.

EXTRACTION OF THE SPIRIT IN ORDINARY PRACTICE.

We may proceed next to examine the methods that are usually adopted for the removal from the skins of the adhering alcohol. Probably the method which succeeds in exhausting the skins most competely, in removing, in fact, practically all traces of alcohol, consists in submitting the husks themselves to direct distillation. This is a practice frequently availed of in the southern portions of France, and by means of which is obtained a cheap brandy known as "*eau-de-vie de marc.*" It is the practice usually to force steam, that is generated in a separate boiler, through a receptacle in which are packed the husks, and to collect the vapours in the usual way in a condenser. The main objection to this practice is its cumbersomeness, and the necessity of carefully rectifying the spirit, which otherwise retains a peculiar flavour characteristic of its origin. I feel somewhat dubious, too, as to the light in which such a practice is likely to appeal to the imaginations of the federal authorities who preside over the destinies of the Customs and Excise.

An alternative method consists in leaching the husks, or washing out the spirit, and subsequently submitting the liquid to distillation. I am not bringing forward this method under the impression that it is in any way a novelty in our midst. I understand that in one form, at all events, it has from time to time, in a more or less desultory fashion, been availed of in some of our cellars. I am not, however, aware that the special method of leaching to which I wish particularly to draw attention has ever been adopted previously in this State.

As a general rule, the husks are merely thrown into tanks, in which they are steeped in water for a varying period. However complete the previous fermentation may have been, the husks still retain appreciable traces of sugar, which results ultimately in a slow fermentation in the steeping vats. This fermentation, however, is always very slight, and in consequence of the relatively small quantity of carbon dioxide that is evolved the upper portions of the husks are always in danger of *acetification*. When the steeping is judged to have been completed, the liquid is withdrawn from the skins in the same way as the wine had previously been done. It is evident, however, that the marc will continue to retain a high percentage of liquid of equal strength to that which has been withdrawn, and which can only be extracted by throwing it a second time in the presses, a practice which involves further expensive



PLAN OF LEACHING TANKS   SCALE, $\frac{7}{16}$ INCH TO 1 FOOT handling. Nor, indeed, can it be said that this process ever succeeds in completely exhausting the skins. I am of opinion, therefore, that, generally speaking, besides involving the winemaker in unnecessary expense, this apparently simple method of leaching the skins is only partially effective. In lieu of it I would submit for your consideration a process which secures a thorough and systematic leaching, without involving any expensive handling. This process has no claim to novelty, excepting so far as the State is concerned. It is merely an adaptation in a simplified form of what I have seen practised in some of the modern French cellars.

SYSTEMATIC LEACHING.

Tis method implies the use of a special plant of no considerable expense, which is illustrated in the text, and which I propose now briefly describing. It consists of a series of tanks, in communication one with the other, and the actual number and dimensions of which are largely a matter of personal convenience. At Roseworthy, during the past vintage, we made use of five square tanks, three feet in all directions, the plan and elevation of which are shown to scale in the accompanying illustration. Where larger quantities of husks are handled it is evident that tanks of increased dimensions would be required. I am not inclined to think, however, that any advantage would accrue from the adoption of dimensions exceeding 6 x 6 and 5 ft. deep.

Each tank communicates with immediately adjacent ones by means of special openings. Thus, tank A communicates with tank B by means of an opening *k* placed 3 inches below the surface of the tank, and leading into a vertical downpipe 1¼ inches in diameter, which opens out into a little basin at the bottom of B. There is also an overflow opening in *n* placed on the same level with *k*. In addition to this, tank A is in communication with a long channel, 3 inches deep, and set towards the back of the tanks, with a gentle fall towards A. The communication is effected by a vertical downpipe *p*, similar in nature to the pipe between A and B. Tanks B, C, and D are connected one with the other in a similar manner, but have no connection with the horizontal channel that runs to the back of them. Tank E communicates with D by the usual downpipe *p*, and in addition to this is connected by means of a short piece of piping, shown in *l*, with the back channel.

The systematic leaching of the husks in these tanks is conducted in the following manner:—First a screen of vine cuttings is placed over the basins which receive the downpipes *p*, so as to avoid choking. The tanks are then loaded with skins from the press to somewhere within the level of the overflow pipes. They should be well pressed down and a screen of vine cuttings placed in front of the openings *n* and *k*. We found that tanks of this size would take 9 to 10 cwt. of husks. All the overflow openings, *n*, are blocked with plugs of soft wood, and, similarly, the openings *m* and *l*, communicating with the back channel. The iron plug closing downpipe *p*, in tank A, is then taken off, and a piece of piping 6 inches in length is screwed on to the downpipe in its place. This is shown in dotted lines in the elevation. A gentle flow of water is now allowed to flow into downpipe *p*, of tank A. This water enters at the bottom of the tank, and gradually drives before it in an upward direction the spirit contained in the skins. When the water reaches somewhere near the level of the opening *k*, its further inflow should be stopped for a few hours. It is subsequently set in motion again, and passes from the top of tank A into the bottom of tank B by the opening *k*. Tank B, therefore, receives a liquid containing already a certain amount of spirit. This liquid is allowed to flow into B until it reaches the level of the draw-off pipe, when again it is interrupted for a few hours. Subsequently, when operations are resumed, the liquid continues to flow from A to B, and passes in addition from B to C, which, in its turn, receives a liquid richer than B. And thus the process continues almost automatically until E has been filled to the level of its overflow pipe, the liquid becoming richer in spirit as it passes from tank to tank. It is allowed to stand a short while in E, and is then drawn from overflow pipe *n* into a tub. I propose referring to the quantity that can be drawn off in this manner later on. It will suffice to state here that we generally drew off about 50 gallons.

At this stage, husks in tank A have been washed five times in succession, and it is assumed that to all intents and purposes what alcohol they may originally have contained has been removed in the leaching process. I might, of course, have tested the skins before unloading the vat. Perhaps I may be in

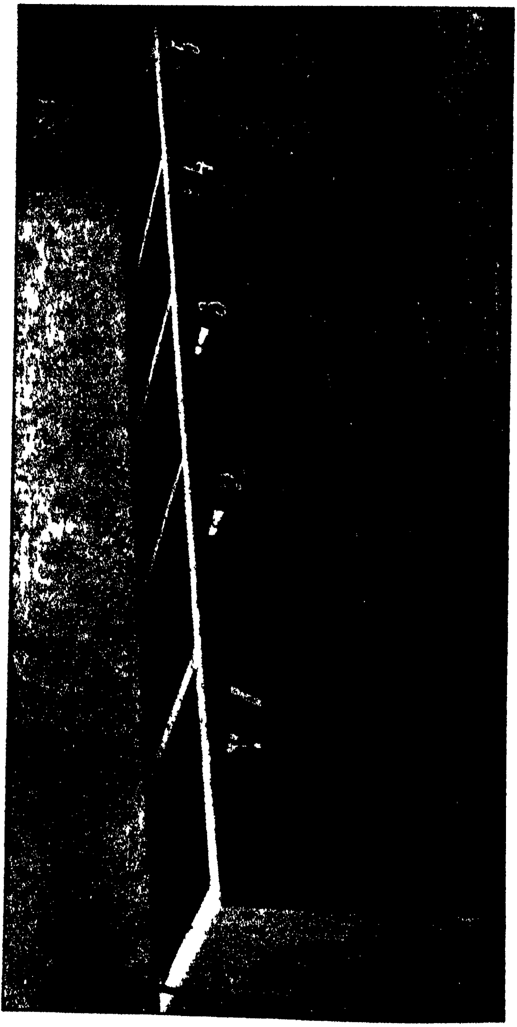


Illustration showing Leaching Tanks in Position a position to do so in 1905. The exhausted skins are removed from tank A, and may be buried, to be used as manure early in the winter. Here I may draw attention to a defect in the Roseworthy tanks, which, however, can readily be remedied. The washed skins are sodden with moisture, and consequently somewhat heavy to handle. Had a draw-off pipe been left at the bottom of the tanks, much of the liquid could have been evacuated by simple gravitation, rendering the handling of the wet skins a less onerous operation.

Tank A is now filled with fresh skins, and the short pipe *t* is removed and screwed on to the vertical pipe *p* of tank B. In its place is screwed in the iron plug; opening *m* in communication with the back channel is unplugged; and opening *k* communicating with tank B, is closed. Similarly pipe *l* in tank E is opened to the flow of the liquid, whilst opening *n* is closed. The water is then caused to come into tank B, instead of tank A, through vertical pipe *p*, it passes from B to C, from C o D, and D to E, by the vertical pipes connecting them, from E it returns backward to A, along the back channel penetrating it by the opening *m*. The liquid is allowed to stand on the fresh skins in A for a few hours, and is subsequently drawn through opening *n* in the same way as in the preceding case for tank E.

It is now time to unload tank B and fill it with fresh skins, and the water is made to start from tank C in the next leaching. And thus the operation continues, from tank to tank, unloading skins that have been leached five times in succession, and replacing them by fresh ones, until all the skins have been dealt with.

It will be noted that the leaching as I have described it is essentially systematic. It is based on the principle that the liquid which successively reaches the lower layers of the skins, being of higher specific gravity than the liquid which imbibes them, the latter will in a great measure be displaced, and rise before the former. It follows that in passing from tank to tank the liquid becomes more and more rich in alcohol. It is obvious that the alcoholic strength of the liquid will increase with the number of tanks through which it is caused to pass. In the present instance we adopted five tanks. It is quite possible that when the alcoholic strength of the wines is low there might be some advantage in causing the liquid to pass through six or seven tanks before collecting. This, however, is a matter that can easily be determined by individual experience.

It is essential that the inflow of water should be slow and gradual, otherwise much of the efficacy of the process is lost. The flow can easily be regulated by means of a high-pressure cock.

I have stated that on the average we collected 50 gallons of liquid from each tank before unloading. In practice, it is as well rapidly to test the strength of the liquid with an *ebullliometer* from time to time, and to cease collecting as soon as the strength is found to be below what can profitably be utilised.

STRENGTH OF THE LIQUIDS EXTRACTED.

The progressive enriching of the liquid as it passes from tank to tank is well illustrated by the following figures, determined at the beginning of operations during last vintage:—

TABLE II.

	Absolute Alcohol.	Proof Spirit.
	%	°
Strength of liquid passing from A to B	2·7	4·7
,, ,, ,, B to C	4·8	8.4
,, ,, ,, C to D	8·6	15·1
,, ,, ,, D to E	9·6	16·8
Average strength of first 50 gallons collected from E	8·8	15·4

In each case the liquid was taken as it began to flow from one tank to another, after having stood on the skins for a few hours. The figures found are sufficiently regular to justify the statement that the liquid increases in strength as it passes from tank to tank.

In Table III I have summarised the strengths of the liquids drawn off from time to time The figures given are not free from irregularities The latter arise mainly from the fact that want of familiarity with the process interfered somewhat with its steady progress, at all events towards the beginning of operations

TABLE III

—	Absolute Alcohol	Proof Spirit
	%	%
Alcoholic strength of liquid drawn from 1st tank	6 8	15 4
, 2nd ,,	6 8	11 9
3rd	4 4	7 7
, 4th	8 0	14 0
, 5th	6 8	11 9
6th ,	8 3	14 5
7th	6 8	11 9
8th	7 6	13 3
, 9th	8 2	14 4

And in the end from 34 62 tons of fruit which had previously yielded 4 922 gallons of wine averaging 13 per cent of absolute alcohol, we extracted an additional 50 gallons of *piquette* averaging 7 4 per cent of alcohol, or 13 per cent proof spirit

I am very far from wishing to bring forward these figures as an indication of the utmost limits of this process In many respects it was new to us, and it is probable that with the experience that has been acquired even better results may be anticipated during the incoming year I would however, draw your attention to the fact that out of an available 73 gallons of proof spirit we succeeded in extracting 65 some portion of the loss being accounted for in the last four tanks from which no liquid was naturally withdrawn

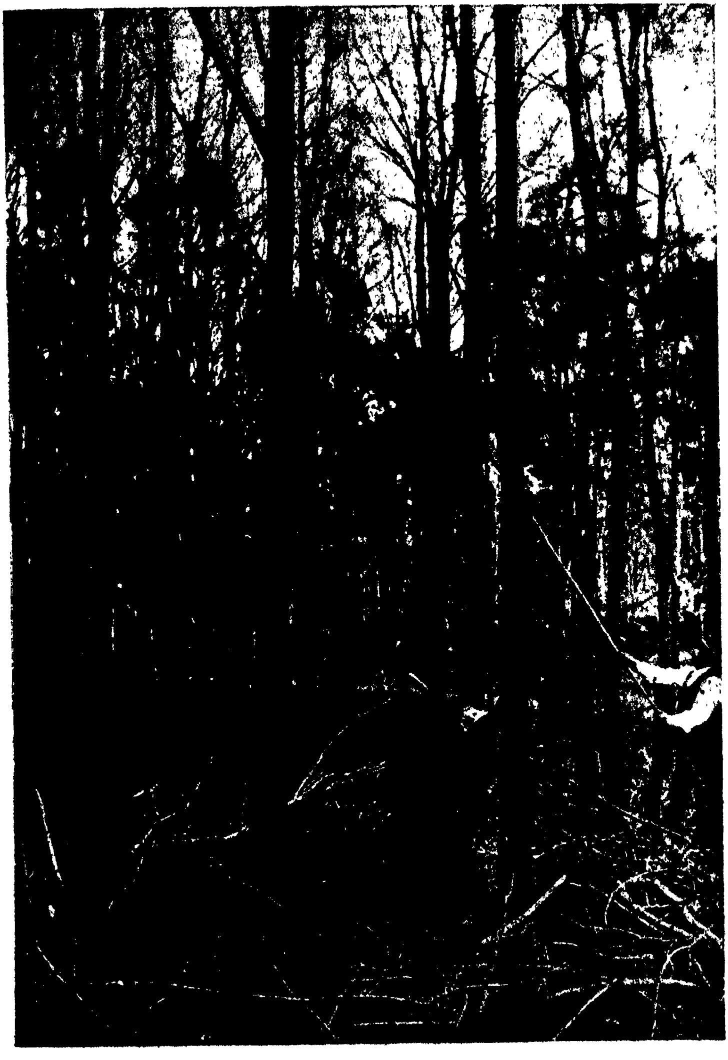
I quite understand that this method of treating the skins that I have described to you cannot be universally adopted Many cellars are not in possession of stills of their own and, under existing regulations they are, perhaps just as well without them others again are at too great a distance to enable them to cart profitably to purchasers a liquid of low alcoholic strength Apart from these exceptions, however I am convinced that the practice of systematically leaching the skins can be adopted with advantage by our winemakers most of whom have far richer husks to deal with than those referred to in this paper The additional handling involved is comparatively insignificant and certainly quite out of proportion with the results achieved

I cannot close without expressing my indebtedness for work done in connection with this matter by Messrs W R Jamieson and L M Hodge Without their help I should not have been in a position to discuss the matter before you to-day

THE HARDY CATALPA.

By WALTER GILL, F L S, F R H S Conservator of Forests

The Hardy Catalpa (*Catalpa speciosa*—Warder) is a tree of special interest to arboriculturists owing to its unique characteristics Baron von Mueller, in his excellent work, "Select Extra Tropical Plants," says of it —"Logs thrown across watercourses for crossing have lasted for three generations, railway posts and platforms are almost indestructible, and canoes made of it never decay Logs a century old and posts half a century old were not in the least decayed" Dr Frank B Hough, a former Chief of the Bureau of Forestry, Department of Agriculture, United States of America in his admirable "Notes on Forestry," after giving details of a similar character, corroborative of its excellence as a timber, quotes the description of it by Dr Engelmann, omitting botanical technicalities, as follows —'A middle-sized tree, with grayish-



CATALPA SPECIOSA, GROWN IN WIRRABARA FOREST.

brown, much cracked or furrowed, at least slightly flaky, bark, and light, yellowish-gray wood, leaves, large, truncate, or more or less cordate at base, slender, acuminate, soft, downy on the under side." Dr. Hough specially mentions also that it has been used to advantage as bridge timber.

The late J. Ednie Brown, when Conservator of Forests for this State, wrote concerning this tree in his "Treatise on Tree Culture," as follows:—"It is indigenous to the middle States of America, where it forms a large tree of over 100 ft. in height, and from 3 to 4 ft. in diameter. Timber very durable; used for telegraph poles, sleepers, fence posts, and machinery construction;" and he further stated that he had in his possession a piece of the timber in excellent preservation which had lain in the ground for seventy-five years. During his term of office a strip bordering the Ippinitchie Creek, in the Wirrabara Forest, amounting to about two or three acres in all, was planted with this tree about twenty years ago, under conditions which were exceptionally favourable to its growth. The soil was of excellent quality, and bordering, as it did, a creek where water ran for the greater part of the year, the amount of soil moisture was usually quite adequate to its need, though during the very dry years lately experienced the falling-off of the generally reliable springs in the vicinity resulted in some parts along the creek's course in giving a decided check to the growth of these trees, which have, however, lately recovered themselves since the advent of better seasons. Most of the trees have made growth which, all things considered, may be regarded as very satisfactory—the size attained is clearly illustrated in the accompanying photograph. The wood, when examined for the first time by a person unacquainted with its peculiarities, invariably produces the impression that it is of little or no value. This probably arises from its extreme lightness, and also from its seemingly weak construction, as it is easily worked, and has certainly an immature look about it. Sections carefully weighed by the writer from thoroughly dry, seasoned wood gave a weight of only 15 lb. per cubic foot, and the bark, when lying about, under all kinds of varying conditions, shows absolutely no kind of alteration in its nature whatever, thus appearing to be totally proof to the ordinary conditions under which other barks rot and decay.

A valuable report on this tree (Bulletin No. 37), by William L. Hall, Superintendent of Tree-planting, was issued by the United States Bureau of Forestry last year, a copy of which was forwarded with the Bureau's usual courtesy to the Forest Department of this State. The interesting details contained therein were obtained after a special study had been made of the behaviour of the trees in plantations established for commercial purposes by various private owners, aggregating in all 975 acres, in different parts of the States. The details of most interest are as follows:—"As a post timber it has given excellent satisfaction. Experiments have left no doubt as to its resistance to decay. The waste product (after cutting out posts and poles, etc.), makes fuel of exceptional value. A high percentage of heartwood is found, even in very young trees, and practically it is uninfluenced by the rate of growth, plantations which have grown very rapidly showing as much heartwood as the slowest growing trees. The sapwood does not greatly resist decay, but since it forms so small a part of the tree its decay is of little importance. The heartwood of the Catalpa forms nearly three-fourths of the volume of the entire tree, even at the early age of five to ten years, and is durable in the ground, if properly seasoned, regardless of age or rapidity of growth. Growers need not, therefore, hesitate about forcing the growth of their plantations as much as possible, nor does experience give them ground to claim a higher value for their products because they have grown slowly. Catalpa wood, after it is cut from the living tree, is one of the most durable timbers known. In spite of its light, porous structure it resists the weakening influences and the attacks of wood-destroying fungi to a remarkable degree; in fact, no fungus has yet been found which will grow on the dead timber." A mass of technical information is also further presented, which is, however, mainly of interest to the forester; and, after thoroughly examining into the measurements there given, the writer, in the annual report for the Forest Department for the year 1902-3 stated as under:—"A careful perusal of the report (by Mr. Hall) shows that the growth of our trees here suffers little by comparison with the trees reared in plantations there. There is one very important difference, however, and that is that, whereas it will grow to profit there (in America) on many sites and over large areas, here it will only grow on specially selected sites of limited extent in close proximity to permanent water."

THE USE OF COMMERCIAL FERTILISERS IN SOUTH AUSTRALIA.

By W. L. Summers, Inspector of Fertilisers.

As the requirements of farmers in the way of fertilisers for the 1904 cereal crop are now practically satisfied, the present is an opportune time to review the work of the season. It is often said that the adoption of the practice of manuring has been the salvation of the South Australian farmer, and this is true probably in a greater degree than is appreciated by many who make the remark. Not only does the application of the manure increase the immediate yield of the cereal crop, but, as is well known, the effect on the feed for several years afterwards is very marked, and it is exceedingly doubtful whether the development of the fat lamb trade would have been possible but for this. At any rate, no one will question that the manuring of the wheat crop has been an important factor in the extension of the practice of keeping sheep on farms. Another advantage gained by the use of these manures has been in the lessened damage from red rust. Last year it was particularly noticeable in most districts that rust-liable wheats that were manured suffered less severely than the same varieties on unmanured land. Probably nothing emphasises the great value of these manures more than the very marked increase in the selling price of farming lands throughout the State. That the State on the whole, has benefited goes without saying, but it is quite impossible to show in cold figures to what extent. The railway revenue has been increased by many thousands of pounds annually in the way of railway freights on manures and machinery, and on the increased crop resulting therefrom. The territorial revenue has benefited, because the manures have made possible the utilisation of hundreds of thousands of acres of Crown lands formerly regarded as valueless for wheatgrowing. What is usually spoken of as the Pinnaroo country is a striking instance of this, as it is universally admitted that were it not for the returns obtained from the use of phosphates in similar land in other parts this large area of country would remain unoccupied. Not only has the State, as a whole, directly profited by the circulation of so much money, and the extra employment of large numbers of men at the ports and places of manufacture, but prosperity amongst the cultivators of the soil has increased the revenue indirectly in many ways.

The use of commercial fertilisers for our cereal crops may be said to date from 1896, as prior to that date only a few thousand acres were manured. The advance since then has been continuous and rapid. The following figures, taken from my records, show the quantities used and the estimated area manured each year since 1897:—

Year	Tons used	Estimated area Manured Acres
1897	3,000	60,000
1898	12,500	250,000
1899	16,500	350,000
1900	24,600	500,000
1901	31,400	700,000
1902	37,500	845,000
1903	44,500	1,000,000
1904	52,000	1,170,000

In calculating the area, up to 1900, I have allowed about 1 cwt. per acre, since that date, 100 lb. per acre. Both are, I am aware, somewhat above the average, but these figures have been adopted to secure a conservative estimate of the acreage. My reason for reducing the quantity a few years ago is that the extension of the practice of manuring to the drier areas has resulted in a reduction of the average quantity applied, as on very large areas the amount does not exceed 70 lb. per acre. Personally, I feel certain that 84 lb. per acre would represent a fair average for the whole State. On this basis, 52,000 tons would cover over 1,385,000 acres. Taking last season's statistical record figures as a basis for an estimate, this season we will have 2,250,000 acres (approximate) under cereal crop. This includes 460,000 acres in the Upper North, where, owing to deficient rainfall, the use of fertilisers is naturally limited to the more favoured localities only. It will be seen, therefore, that over three-fourths of the total area under crop in the four other statistical districts have this year been manured. With the opening up of land at Pinnaroo and in the hundreds west of Spencer's Gulf, it is probable that for the next two or three years the demand for manures will continue to increase.

A few figures showing the financial side of this subject may be of interest. Taking into consideration the retail values of the respective brands of manures which constitute the total, and allowing 7s. 6d. per ton as the average cost for freight from port or place of manufacture for local makes to the farm, 52,000 tons of manure will cost the farmer £236,000. Allowing that wheat is worth 2s. 6d. per bushel on the farm after paying for the cost of the bags, it will require 1,888,000 bushels of wheat to pay the manure bill. What the actual increase is in our harvest returns it is impossible to say, but when all expenses connected with the use of manures are taken into consideration it must be fully double the above quantity.

PHOSPHATE GRIT FOR POULTRY.

All authorities on the feeding of poultry are agreed as to the absolute necessity for a supply of clean, sharp grit being provided, as without it it is impossible for the birds to properly break up the food in the gizzard. Most poultry keepers fail to realise what an important part *sharp grit* plays in the economical utilisation of the food and in the health of fowls. Where fowls have a fairly large range, they can pick up a certain amount of grit; but rarely can they obtain sufficient for their requirements. Young chickens also require grit in their food, and a supply of this will go a long way to keeping them in health. Some poultry keepers make it a practice to mix grit with the chickens' food, to ensure their getting a regular supply.

The following extract from Compton's "Australian Book of Poultry" deals forcibly of the relation of grit to health:—

"Bowel diseases also carry off thousands of promising chickens each year, and the main causes of these are improper food, being chilled by extreme cold or wet weather, and neglect of giving a good supply of grit. It is often difficult to ascertain to which of the three causes mentioned they are attributable; but frequently the three will be found combined. In the majority of cases, no doubt, it can be distinctly traced to want of grit. Without the latter, the gizzard is unable to perform its proper functions, and places the chickens in exactly the same position as a hungry man without teeth, by being unable to masticate food. A chicken, being hungry, greedily swallows the food offered. The food fills the crop, where it becomes moistened and softened, then passing on to the gizzard, and, from lack of grit in that organ, lies there, irritating the gizzard and delicate internal organs, and the tax placed upon the gizzard by the violent efforts to manipulate the food excretes the fluids which assist digestion, and this excretion of the digestive fluids is frequently mistaken for dysentery. It stands to reason that a chicken so situated, even if it survives for a time, cannot come to any ultimate good; and it merely resolves itself into the question of how long its strength can sustain life, eventually becoming a victim to the owner's stupid neglect. We have a firm conviction that, next to lice, want of grit is the greatest cause of excessive chicken mortality."

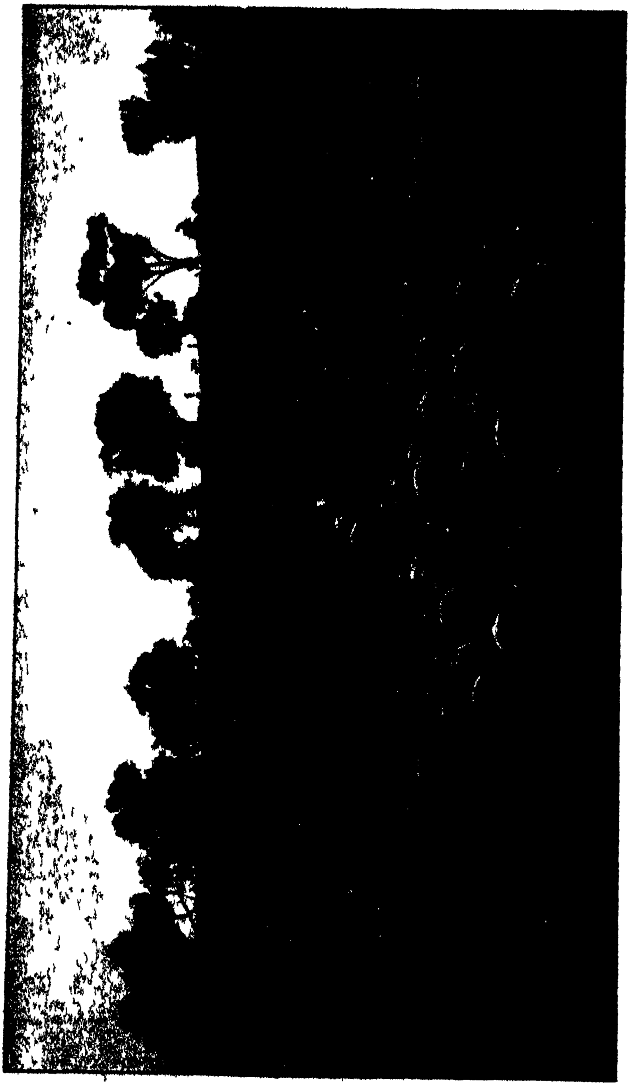
Recently the New York Agricultural Experiment Station published a bulletin dealing with the importance of mineral matter and the value of grit for chicks. In a number of feeding trials previously carried out it was found that certain rations of entirely vegetable origin, supplemented with bone ash to supply the mineral constituents required, were quite as efficient as rations containing much animal food. Ordinary grain foods are low in lime content, but carry considerable proportions of phosphorus. The deficiency in lime is easily supplied to laying hens by crushed oyster shells, etc.; but it has been demonstrated that growing chicks require more phosphorus than the grain supplies. The benefit derived from animal food was often found to be very largely due to the mineral matters contained therein. This conclusion led to experiments with ground phosphate rock, mixed with sharp sand, both as grit and as a source of phosphorus. The results of a number of tests are summarized as follows:—

The mixing of sand in the food, both in a ration containing animal food and one without, resulted in better health for the chicks, and more efficient use of the food The addition of raw ground phosphate and sand to rations with and without animal food resulted in better growth and more efficient use of food than when sand alone was added The addition of ground rock to rations without animal food resulted in more rapid growth and more efficient use of food than the addition of sand alone The addition of ground rock phosphate to rations with and without animal food was followed by better growth and, on the whole, from less food than the addition of finely ground oyster shell Food mixed with ground oyster shell was less healthful and less efficient than the same food mixed with fine sand Mixing bone ash and ground oyster shell in the food resulted in more rapid growth than the mixing of sand alone but owing to the action of the oyster shell the feeding was less profitable In these tests up to 2 oz of rock phosphate and 1 oz of fine white glass sand were mixed with 24 oz of dry food The sand contained 99 5 per cent of silica Finely ground bone is considered a better source of phosphorus and lime than rock phosphate

The difficulty confronting the average poultry keeper in South Australia is to obtain good, sharp grit suitable for his requirements Some fanciers break up glass or crockery and speak very highly of its value, but this is a troublesome and somewhat dangerous task Deposits of sea shells are drawn upon largely, and while the broken shells are sharp enough at first they are too soft and quickly lose their edge in the gizzard with the result that if the birds eat all they want as grit there is great danger of the gizzard being overloaded with limy materials Good clean, sharp sand is useful but better results are secured with sharper materials If any of our larger quarry owners would supply broken quartz grit at a reasonable price, nothing better could be desired but apparently there is not sufficient appreciation amongst poultry keepers of the value of hard grit to create a sufficiently large demand for this material It will be seen from the experiments quoted that ground phosphate rock has a high value and while ground bone is considered better, the treatment necessary to remove all danger of carrying disease renders it somewhat expensive With the object of overcoming this difficulty the Manager of the Adelaide Chemical and Fertiliser Company has, at the suggestion of the Department of Agriculture, undertaken to make up a few cwts of a special poultry grit containing a large proportion of ground phosphate rock Small samples may be obtained on application to the Adelaide Chemical and Fertiliser Company's office, or will be sent to applicants forwarding cost of carriage to the Manager of the Company

'JOURNAL OF AGRICULTURE."

From January 1, 1904, the "Journal of Agriculture" will be posted to anyone resident in South Australia bona fide engaged in the cultivation of the soil on payment of a REGISTRATION FEE of One Shilling per annum. Single copies will be supplied at 3d. each; back issues at 2s. 6d. per doz. The indexes of Vols. I. to VI. can be obtained by members of the Agricultural Bureau and subscribers desirous of binding their volumes.



Crop of Self-sown Piemelons Growing on Sandy Land at Plympton.

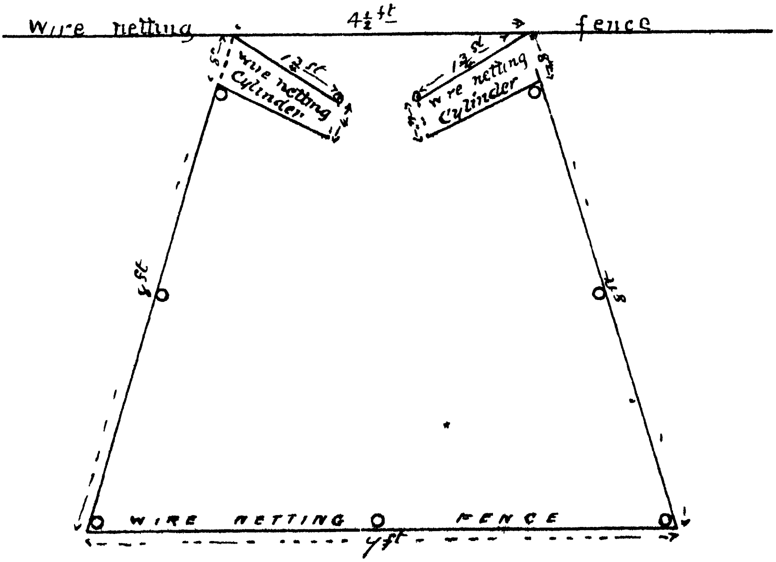
PIEMELONS AS A FODDER CROP.

In view of the fact that piemelons do well on so much of our lighter soils, it is a matter for surprise that they are not more largely grown. The melons require very little attention, seed is cheap, and the fruits can be harvested at leisure and, if carefully handled, will keep for a long time. Cattle, pigs, and poultry become very fond of the melons, and while it is true that they consist very largely of water, they make a very valuable adjunct to dry foods.

The accompanying illustration shows a self-sown melon patch on the property of Mr. J. Bridgland, at Plympton. Mr. Bridgland states that these are growing on an acre of sandy land which was enclosed as a run for pigs. The previous year the pigs were fed occasionally on raw melons, the seed of which must have passed through the animals, as this summer melon plants appeared all over the paddock. Many of the melons weighed up to 60 lb., and Mr. Bridgland estimated the yield of the paddock at 35 to 40 tons per acre. A return of 20 tons per acre would undoubtedly prove profitable in view of the very small outlay for seed and the little cultivation or attention required. One farmer who has considerable areas of light red sandy land makes it a practice to scatter a few piemelon seeds ahead of the cultivator when working a portion of his fallow land in September, and usually harvests a considerable tonnage of melons, which he uses mixed with dry rations for his cattle, and also for feeding to pigs and poultry.

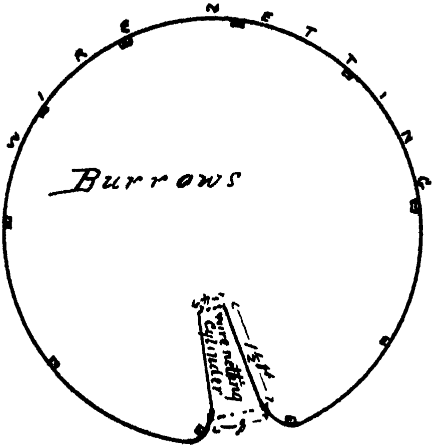
TRAPPING RABBITS INSIDE FENCES.

At a recent meeting of the Johnsburg Branch of the Agricultural Bureau Mr. T. Potter submitted sketches showing plan of yard for catching rabbits travelling along a wire-netted fence, and also method of dealing with rabbits in large burrows.



Rabbit-trap Yard

The above sketch almost explains itself. A wire-netted enclosure is made against the ordinary rabbit-proof fence in the shape as shown. A short distance from the fence is a netting cylinder 21 ins. long, 8 ins. in diameter at the entrance, and tapering off to 4½ ins at the other end. The rabbits will follow the fence along until they get blocked at the corner of the yard, then they will make along the yard until they find the entrance at the cylinder. While the rabbits will go into the yard through the narrow end Mr Potter finds that they will not attempt to force their way out again, and in this way he has trapped many hundreds of rabbits. Unless some protection such as a hollow log, is provided inside the yards, the crows will soon peck the eyes out of the rabbits. By placing an empty sack over one end of the log the rabbits can be easily captured and destroyed.



NETTING LARGE BURROWS

This is simply an ordinary wire-netting enclosure around large burrows, or those in rough ground which cannot be conveniently dug out or closed up. The netting is secured to posts at required intervals, and is let into the ground to a depth of 3 ins or more. The rabbits outside the burrow will follow the netting until they find the entrance, and once inside rarely make their way out again.

SOME NOTES ON THE ROTTING OF APPLES.

By George Quinn, Horticultural Instructor.

It is commonly stated that the "apples are not keeping so well this season" as formerly, and it is generally attributed to the rainy summer and the sappy fruits which have resulted. In several instances, owing to the lack of shipping facilities, importers have been compelled to store the cases for several weeks after they had been filled for export, and these have experienced considerable trouble and loss owing to decay setting up in a few specimens. One large shipper was put to the trouble of repacking hundreds of cases owing to this defect. Being asked to make an inspection of the contents of these cases, and if possible define the reason for this unexpected development, a close scrutiny of the decaying apples found in a great many cases was made and in nearly every instance the skins were found intact and unbroken, enclosing a liquid mass of decaying matter. A number of typical specimens were taken, and on Plate I. three typical specimens show the decay in three stages of progress. The first figure shows the disease to have reached the skin in many places indicated by the sunken surfaces. Fig. 2 has one large typical patch of decay, while Fig 3 is in an advanced stage, and the white and sage green patches of the spore masses of the fungus may be plainly seen In this case the apple is quite collapsed, and absolutely rotten It is quite a common occurrence to find this fungus growing upon the surfaces of decayed fruits, but as soon as any of these fruits were cut open the presence of the filaments of the common blue mould (Penicillium glaucum) could be readily detected in the interior cavities Sections of the pulp, when subjected to microscopic examination, revealed the presence of the mycelial filaments permeating the whole thickness from the core to the skin of this apple, and the erect spore-bearing hyphæ, projected through the rapidly disintegrating skin The small portion of the pulp yet remaining sound was not ramified by these growths but, doubtless, as the cellular tissue became changed along its edges owing to the operations of the nutritive functions of the fungus, the whole pulp would be gradually brought in this manner under its influence The network of filaments and the spore-bearing hypha shown in Figs 1 and 2 of Plate III. are drawn from microscopic sections taken from the specimen referred to It may be of interest to state that the sage-green masses often seen upon such rotting fruits consist of myriads of microscopic spores, which individually are colourless, but when massed they, by some optical effect, appear to be green, and not, as we commonly say, "blue mould" These spores are formed by the upper ends of the branching hyphæ becoming constricted into sections. They are extremely

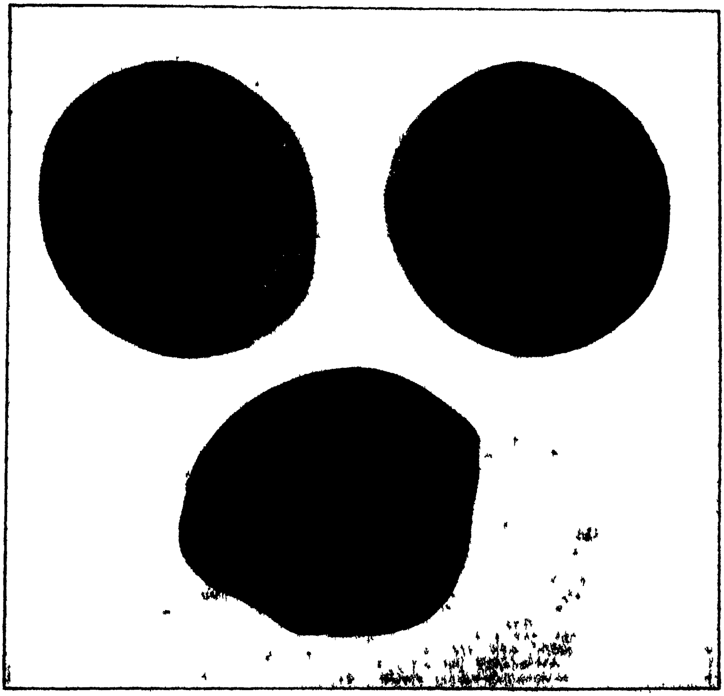


PLATE I

Apples in various stages of decay caused by "blue mould" light, and float in the atmosphere more or less. This is readily seen when, like a cloud of dust, they rise wherever a mouldy fruit is cast to the ground. They are extremely tenacious of life, and are recorded in standard biological works as having withstood a dry heat up to 248 deg. Fahr. The spores of Penicillium have been germinated after being kept for two years. They are said to germinate at extremely low temperatures, viz., 35 deg. Fahr., and in a heat as high as 109 deg. Fahr., but the temperature favouring the most rapid development is about 70 deg. Fahr. When these spores come into contact with moisture in a temperature between 35 deg. and 109 deg. Fahr they germinate, and each one sends out one or more filaments, which begin to absorb any nourishment that may be found whereon they are growing. In such cases the filaments increase rapidly in length and rebranch, usually sending down short growths into the soft substance on which they are creeping, and others are soon pushed up, which ultimately take the form of the spore-producing growths seen in Fig. 2 of Plate III. The horizontal or creeping filaments form the mycelium, whilst the lower hyphæ are called the descending or submerged hyphæ, and those above, bearing the spores, are known as aerial hyphæ or conidiophores.

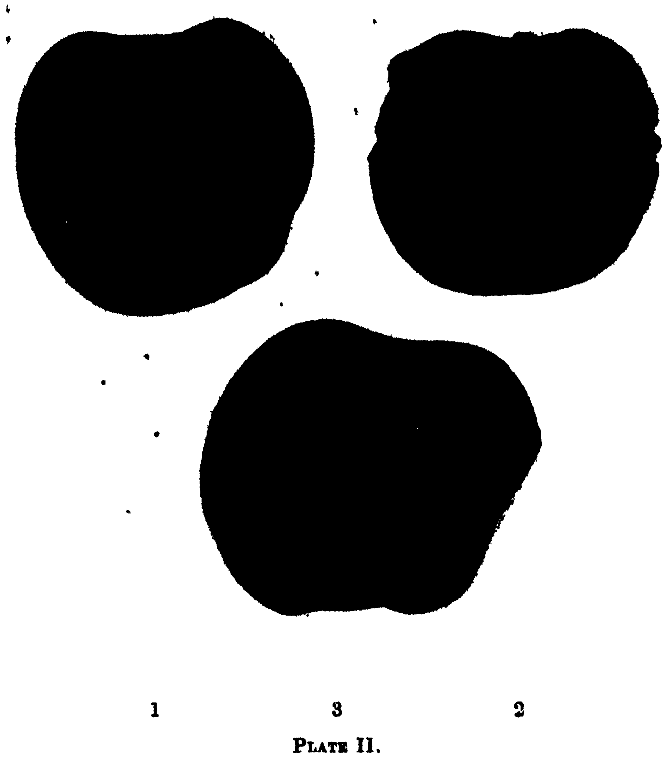


Plate II.

Showing where the mould effects an entrance to the apples.

Under normal conditions the stout epidermal cellulose coat or skin which completely envelopes our fruits baffles the penetration of the hyphæ of the Penicillium. When, however, the skin is ruptured or an entrance found to where the cell walls are not so stout, the fungus at once finds a foothold. The specimens figured in Plate II. show pretty clearly the means of ingress available in these fruits. Fig. 1 is a section of a sound specimen of the well-known Cleopatra or New York Pippin apple. The long, cylindrical calyx tube running uninterruptedly from the outside into the seed cavities may be noted. This is one of several serious defects to which this valuable apple is very liable, and to my knowledge no other variety presents such opportunities for the ready entrance of insect and fungus parasites In the fruits of no other popular variety is the "blue mould" fungus so frequently found as in this one. In Fig. 2 the mycelial filaments extend throughout the whole of the tissue which is darkened. The means of ingress is readily seen in the tunnel seen running from circumference to centre on the upper right hand corner of the fruit. In the fruit represented in Fig. 3 no such tunnel exists, but the open tube described in connection with Fig. 1 undoubtedly supplied the means whereby the fungus gained an entry. These apples were each wrapped in separate pieces of tissue paper when they were packed for export, and the free ends of the papers screwed closely together, consequently we may assume that the spores of the mould were enclosed with the fruits. As they germinate freely in the dark, such enclosing and packing presented no deterrent to their progress. Further, the spores must have lodged in the calyx tubes, tunnels in the apples, or been carried in by the caterpillar where the fruits had been tunnelled by the codlin moth larvæ. If these cases had not been opened for inspection the decayed fruits, though few in number in each box, would have spilt moisture and mould germs upon the remainder on the voyage. In all probability the contents would have been sold as "slacks," if not absolutely rejected, and the shippers been put to loss, for which they might be inclined to blame the shipping engineers. The only lessons we may adduce from this experience suggests that we (1) try to avoid putting codlin moth damaged apples into the cases; (2) to rigidly avoid packing any apple the skin of which shows any sort of a puncture or suspected soft spot which may puncture in the process of ripening; (3) never allow any mouldy decaying fruits to lie about or be kept on the premises where the apples are stored or being packed; (4) to keep the packing cases and wrapping papers as clean as possible; and (5) where possible make all store and packing rooms so that they may be made airtight, and fumigated with sulphur to destroy the germs of the mould.

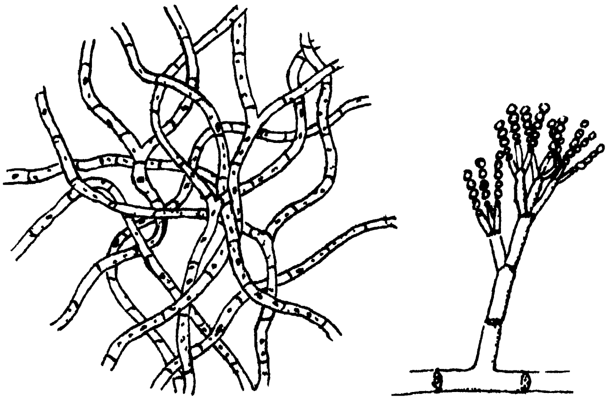


PLATE III.

Sections showing the Mycelium and an aerial spore-bearing hypha of "blue mould."

DEPARTMENTAL NOTES AND WORK.

Professor Towar, Principal of the Roseworthy Agricultural College and Professor of Agriculture, will be leaving South Australia early in June, he having tendered the resignation of his offices as from May 31. It is expected that steps will be taken to fill the position at an early date. In the meantime Professor Perkins will, so far as his other duties permit, supervise the work at the College.

During May three additional students have been received at Roseworthy College, making a total of 38 now on the roll.

The time for receiving applications for the position of Dairy Instructor expired on June 1. A considerable number of persons from all parts of Australia have applied for the position, which, it is expected, will be filled early in June, in order that the successful applicant may commence his duties as soon as possible after July 1.

During May Mr. Quinn has addressed representative meetings of fruitgrowers from Cherry Gardens, Clarendon, and the surrounding districts at Clarendon, in connection with the proposed Bill dealing with diseases in vegetation. Similar gatherings at Mount Compass, Willunga, Watervale, Clare, Wirrabara, Ashton, Longwood, and the East-End have been attended with a like object. The suggestions in the Bill have been discussed and criticised, and motions passed in most instances adverse to its becoming law. A strong feeling in favour of the resuscitation of the present law has been evinced in most cases.

For the month ending May 25, the Inspectors under the Vine, Fruit, and Vegetable Protection Act admitted into the State 3,707 cases of fruit, containing 6,550 bushels. These almost solely consisted of tropical produce from Queensland and New South Wales. Plants to the extent of 98 consignments came to hand. Of these 17 small lots were detained, owing to the absence of the necessary declarations respecting their origin, etc. Amongst those admitted were 18 bundles containing 4,525 fruit trees; and 4,500 stocks, on which to graft fruit trees. These, after disinfection, were admitted. Among the fruits, 236 cases of bananas were destroyed, owing to overripeness and suspicion of disease. The exports consisted of 6 502 cases, containing approximately 7,465 bushels. These consisted of 15 different kinds of fruits, amongst which in quantity apples outdistanced all other kinds. Plants to the number of 96 lots were passed for export to those States requiring inspection certificates from this State. The export of vegetables totalled 2,516 packages, each of which is estimated to weigh 2 cwt. These, with few exceptions, were forwarded to Broken Hill.

Swine fever developments in Victoria have lately been of a somewhat startling character. Pigbreeders had been led to hope that the disease was well under control, and relaxation of the quarantine regulations in certain districts had been discussed. According to the Victorian papers the cold, wet weather has heralded a very serious outbreak near Bairnsdale, resulting in heavy losses, one owner losing 500 and another 400 pigs. This outbreak is significant of the possibilities before our pigbreeders should any pigs from the South-East be permitted to carry infection to new localities. It is a well-known fact that many serious diseases of stock, appearing first in a relatively mild form, become practically chronic for a time in certain herds. Although the germs of the disease in such instances may appear to lose vigour, they will, on carrying infection to new centres, often result in outbreaks of a very virulent nature.

COUNCIL OF AGRICULTURE.

The monthly meeting of the Council of Agriculture was held on Wednesday, May 11. There were present—Mr. R. Caldwell (Chairman), Col. Rowell, C.B., Messrs. F. Krichauff, A. Molineux, J. W. Sandford, G. R. Laffer, H. V. Pridmore, A. M. Dawkins, J. Miller, B. Basedow, T. E. Yelland, and R. Marshall.

The Secretary reported that the small wheat-testing mill required several sets of sieves, etc., before it could be used for testing wheat, and as no trials had yet been made he had been unable to ascertain what the charge for the work would be. Mr. F. B. Guthrie, the New South Wales Agricultural Chemist, in writing to the Department some time previously, had stated that £2 2s. to £3 3s. would be a reasonable charge for making a complete test of any sample. The question arose, therefore, as to who would pay these fees. Mr. Marshall was sure that it was never intended when the mill was obtained that the farmer should be asked to pay the fees; he supposed the Government would do the work free of charge. It was decided that the Committee on Agriculture and Stock should go into the matter and report to the Hon. Minister.

The Minister forwarded memorandum from the Director of the Botanic Gardens endorsing the suggestion of the Council that a small committee of practical fruitgrowers should assist him in determining the commercial value of the fruits at Mylor Typical Orchard as they came into bearing. He also intimated that he would be pleased at all times to receive suggestions and help from the individual growers. On the motion of Mr. Laffer, it was decided to ask the Minister to appoint a small committee of fruitgrowers for the purpose indicated.

The Secretary reported that the arrangements for the egg-laying competition at Roseworthy College, under the auspices of the Royal Agricultural Society, had been completed. The pens would be situated in the carob grove, which would afford good shelter, and should prove a very suitable location. The birds would be under the direct supervision of the College authorities. Col. Rowell referred to the Magill competition results, which financially did not show much profit apart from the sittings of eggs sold. The market value of the eggs was only slightly more than the cost of the food. Mr. Sandford said the committee never expected that the returns would pay for food and labour, as some of the pens were very poor layers, and the cost of food was unusually heavy.

The College Committee called attention to the fact that of late years nearly all the free scholarships offered at Roseworthy College had been won by boys from the Adelaide Agricultural School and that many of them were town residents. The intention of Parliament in voting money for these scholarships was undoubtedly to give the sons of farmers, who could not afford the usual fees, an opportunity of taking the three years' course at Roseworthy, but, owing to the very stiff examination papers set, no country lad had much chance of securing the necessary percentage of marks, unless he first studied for at least twelve months at the Adelaide School. As this was defeating the intention of Parliament, the committee suggested that the written examination should be made about equal to a public schools' fifth class test, and that greater attention should be given to examination in practical agriculture. This was unanimously endorsed by the Council.

It was decided to again direct attention to the necessity for providing proper shed accommodation for the machinery at the College Farm, much of which cannot at present be properly protected from the weather.

Some discussion took place on a recommendation that the sugar gums along the main entrance to the College should be removed, as they were considered unsuitable, and no ornament to the place. It was suggested that a better class of trees should be planted in their place, to form an avenue to the College Building. The matter was postponed for a month.

Some discussion took place on the Principal's report. The deaths of lambing ewes was generally attributed by the members to the injurious effects of stinkwort which appeared most marked when in flower. The value of kale for early feed also came in for attention, the Principal's report being endorsed by several members. It was pointed out that the old stumps of kale made rapid and vigorous growth after the first rains, giving supplies of feed much earlier than rape.

The following gentlemen were approved as members of the undermentioned Branches:—Messrs. A. J. Alexander and W. Oliver, Reeves Plains; A. S.

Inglis, Gladstone; H. Allen, Willunga; M. Tuck, Balaklava; J. Windebank Kapunda; R. Salmon, Quorn; J. Perry, Morphett Vale; A. S. Payne, G. Tyler, and A. Weyland, Bowhill; C. Stone, Meadows; J. Hoar and W. H. Whittaker, Port Broughton; E. S. Bristowe, Amyton; W. J. Wood and A Lewis, Waikeri; P. Rogers, Arden Vale; C. E. Mann, Murray Bridge.

On the motion of Mr. Pridmore, it was resolved that, in the opinion of the Council, active steps should be taken to deal with the sparrow and starling nuisance, and that the Government should support any action in this direction taken by the Royal Agricultural Society and the Vinegrowers' Association.

ANALYSES OF FERTILISERS.

By W. L. Summers, Inspector of Fertilisers.

The following results of analyses of samples of fertilisers obtained by myself during the past four months are published for general information In each case the certificate of constituents, or guarantee registered by the vendor, is shown in brackets, thus (36 per cent.), immediately before the results of the analyses. As additional samples are obtained and tested the results will appear in *The Journal*:—

Elder, Smith & Co's Ceres Superphosphate.—Water-soluble phosphate (36 per cent.), 38.1 per cent., 38.7 per cent., 39.3 per cent.

Elder, Smith & Co.'s Lawes' Superphosphate.—Water-soluble phosphate (36 per cent.), 39 per cent., 39.6 per cent., 37.3 per cent., 37.3 per cent., 39.4 per cent.

Norman & Co.'s Superphosphate.—Water-soluble phosphate (35 per cent.), 36.6 per cent., 37.2 per cent., 38.7 per cent.

Norman & Co.'s Reliance Superphosphate.—Water-soluble phosphate (32 per cent.), 35.1 per cent.

George Wills & Co.'s United Alkali Company's Superphosphate.—Water-soluble phosphate (36 per cent.), 37.4 per cent., 38.4 per cent.

Adelaide Chemical Works Co.'s Mineral Superphosphate.—Water-soluble phosphate (36 per cent.), 39.3 per cent., 41.9 per cent., 38.5 per cent., 40.5 per cent., 34.9 per cent.

Wallaroo Phosphate Co.'s Superphosphate.—Water-soluble phosphate (36 per cent.), 39.3 per cent., 41.2 per cent., 39 per cent.

Clutterbuck Brothers' United Alkali Co.'s Superphosphate (Planet Brand).—Water-soluble phosphate (36 per cent.), 37.6 per cent.

Clutterbuck Brothers' Special Superphosphate.—Water-soluble phosphate (37 per cent.), 38.7 per cent.

D. & J. Fowler & Co., Limited, Lion Brand Superphosphate.—Water-soluble phosphate (36 per cent.), 44.3 per cent., 43.3 per cent.

D. & J. Fowler & Co., Limited, Lion Brand Superphosphate.—Water-soluble phosphate (39 per cent.), 45.4 per cent., 44.3 per cent.

Adelaide Chemical Works Co.'s Bone Superphosphate.—Nitrogen (2.1 per cent.), 1.8 per cent.; water-soluble phosphate (15.2 per cent.), 22.8 per cent.; citrate-soluble phosphate (15.8 per cent.), 12.2 per cent.; acid-soluble phosphate (6.8 per cent.), 4.3 per cent.

Adelaide Chemical Works Co.'s Guano Superphosphate.—Water-soluble phosphate (25 per cent.), 33.8 per cent., 33.7 per cent., 35.2 per cent., 34.4 per cent., 35.1 per cent., 31.6 per cent.. citrate-soluble phosphate (5 per cent.), 2.4 per cent., 3.7 per cent., 1.7 per cent., 1.5 per cent., 2.5 per cent., acid-soluble phosphate (3 per cent.), not tested

Adelaide Chemical Works Co.'s Bonedust.—Nitrogen (3.5 per cent.), 3.7 per cent., 3.4 per cent.; acid-soluble phosphate (45 per cent.), 43.4 per cent., 45.8 per cent.

Crompton & Son's Bonedust.—Nitrogen (3.9 per cent.), 3.9 per cent., 4 per cent.; acid-soluble phosphate (44.67 per cent.), 45.2 per cent. 46.8 per cent.

L. Conrad's Bonedust.—Nitrogen (2.5 per cent.), 3.15 per cent.; acid-soluble phosphate (45.2 per cent.), 38.2 per cent.

Excelsior Manure Co.'s Bonedust.—Nitrogen (2.73 per cent.), 3.44 per cent.; acid-soluble phosphate (40 per cent.), [illegible] per cent.

Excelsior Manure Co.'s Bone Manure.—Nitrogen (2 per cent.), 2.94 per cent., acid-soluble phosphate (30 per cent.), 35.5 per cent.

E. Anders & Son's Victor Bonedust.—Nitrogen (3 per cent.), 4.1 per cent.; acid-soluble phosphate (42 per cent.), 45.5 per cent.

Adelaide Chemical Works Co.'s S.A. Super.—Water-soluble phosphate (30 per cent.), 34.6 per cent., 35.6 per cent., 33.8 per cent., 34.6 per cent., 24.5 per cent., citrate-soluble phosphate (2 per cent.), 1.6 per cent., 1.4 per cent., 3.9 per cent., 1.4 per cent., acid-soluble phosphate (3 per cent.), not tested.

Adelaide Chemical Works Co.'s Wheat Manure.—Nitrogen (1.05 per cent.), 0.95 per cent., water-soluble phosphate (28.1 per cent.), 28.8 per cent., 28.9 per cent., citrate-soluble phosphate (5.9 per cent.), 6.5 per cent., 5.5 per cent.; acid-soluble phosphate (6 per cent.), not tested.

Adelaide Chemical Works Co.'s Hay Manure.—Nitrogen (1 per cent.), 0.65 per cent.; water-soluble phosphate (30 per cent.), 31.1 per cent.; citrate-soluble phosphate (2 per cent.), 4.9 per cent.; acid-soluble phosphate (3 per cent.), not tested.

Adelaide Chemical Works Co.'s Super B.—Water-soluble phosphate (15 per cent.), 36.7 per cent.; citrate-soluble phosphate (15 per cent.), 3.7 per cent.; acid-soluble phosphate (5 per cent.), not tested.

DATES OF MEETINGS OF BRANCHES OF THE AGRICULTURAL BUREAU.

With a view of publishing in the "Journal" the dates of meetings of the Branches of the Agricultural Bureau, Hon. Secretaries are requested to forward dates of their next meetings in time for publication

Branch	Date of Meeting		Branch	Date of Meeting	
Amyton	June 23	July —	Mount Remarkable	June 23	July 21
Balaklava	11	9	Mundoora	24	19
Booleroo Centre	28	12	Nantawarra	22	13
Bowhill	4	2	Naracoorte	11	9
Brinkworth	4	8	Narridy	—	16
Burra	17	15	Norton's Summit	24	8
Carrieton	28	12	Onetree Hill	23	7
Cherry Gardens	14	12	Orroroo	24	—
Clare	24	8	Paskeville	25	—
Colton	4	2	Penola	11	9
Crystal Brook	18	—	Petina	25	23
Elbow Hill	28	12	Pine Forest	28	12
Eudunda	27	25	Port Broughton	23	21
Finniss	[illegible]	4	Port Elliot	18	16
Forest Range	23	7	Port Lincoln	17	15
Forster	18	—	Port Pirie	25	23
Gawler River	24	22	Pyap	1	6
Golden Grove	23	14	Redhill	28	26
Inkerman	28	26	Reeves Plains	24	22
Johnsburg	25	23	Rhine Villa	24	—
Kanmantoo	24	8	Richman's Creek	27	11
Kapunda	4	2	Riverton	25	9
Kingscote	13	11	Saddleworth	17	15
Kingston	4	2	Stansbury	4	2
Koolunga	23	7	Stockport	27	25
Lyndoch	3	21	Strathalbyn	21	19
Maitland	4	2	Utera Plains	25	9
Mallala	6	—	Virginia	27	11
Mannum	18	—	Wandearah	27	11
Meadows	26	—	Watervale	27	25
Minlaton	18	30	Wepowie	21	26
Morchard	25	—	Whyte-Yarcowie	18	16
Morgan	25	—	Willunga	4	2
Mount Bryan East	25	23	Wilmington	22	13
Mount Pleasant	17	—			

FARM AND DAIRY PRODUCE MARKETS REVIEW.

Messrs. A. W. Sandford & Company report on June 1, 1904:—

Agriculturists are not at all satisfied with the rainfall during May, for whilst Adelaide and Southern districts report quite up to the average, farmers in the Middle and Northern areas are disappointed at the dry conditions that prevailed throughout the month. Reports, however, are just to hand that the present coastal disturbance has extended into the drier districts and, although the showers have only been light so far, hopes are still entertained of a better downpour. On the other hand, excellent rains have fallen in the Far Northern pastoral country.

With the setting in of winter, business is not any too brisk, the general complaint being that May has been a dull month for traders; but, as farmers have now about completed seeding, they are more disposed to effect sales of the Wheat which they have held on to so tenaciously. This, no doubt, will help to bring about a better circulation of capital. Silver mining at Broken Hill continues to go along steadily, most of the big mines turning out fairly satisfactory results. Metals.—Silver is on about a par with former report, but Lead has had to give way. Copper also seems to have a downward trend.

Breadstuffs.—Early in the month U.K. values advanced fully 1s. per quarter, and considerable business was done in cargoes at 29s. 6d. to 29s. 9d. To-day, however, the market is lower, as there are sellers at 29s. without finding buyers. Wheat has been sold in Adelaide, Melbourne, and Sydney at 3s. to 3s. 1½d. f.o.b. in large parcels; but in consequence of London advices buyers are not so anxious as they were. Fodder.—Chaffcutters are still complaining of the almost absence of shipping orders, only a few odd lots of specially prime finding buyers for Sydney. Millers' Offal.—Pollard has been neglected for some weeks; but there has been a good demand for Bran at 7d. to 7½d., for export to Western Australia, and although millers' stocks are very light, there are resellers in the market for delivery in the city at relatively lower prices. Feeding Grains are also reported dull, sales only being effected to meet immediate trade requirements. Cape Barley.—The market is comparatively bare of stocks; but even so, the line has not much call.

The Potato market has been in a very unsatisfactory condition, values throughout the Commonwealth ruling at lower rates than experienced for many years, and, unfortunately, there is no prospect of any immediate recovery. Locally grown have been in sufficient quantity to supply city and suburban wants, but are at last showing signs of tapering off. Result, Gambiers have had but a very light month's trade, having to depend only on country orders and a few odd parcels for export; so that the market has even a further drooping tendency. Onions.—The position in this line is very similar to that of potatoes, only the local tuber filling Adelaide demands

Dairy Produce.—During the early part of May fresh Butter in prints showed a remarkable increase; but this was more the result of lots that had usually found their way to Broken Hill being diverted to Adelaide But, unfortunately, at this time of the year a number of these were only of a secondary grade, so that values for such ran down until spring rates were touched. However, with the setting in of colder weather, lower grade qualities are almost certain to cut off. On the other hand, factory prints and prime dairies well sustain. Bulk Butter.—The eastern States have been consigning fairly heavy parcels to this market, and although the quotations are exceptionally low, the imported article meets with only very meagre sales, many of the shipments having to go into cold store. Eggs had an abrupt run down in values of quite 6d. per dozen. This not so much caused by any increase, but that pickled and refrigerated secured the market for the time. Towards the end of the month, however, a recovery of quite 2d. per dozen was established. Cheese.—The continued heavy demand, partly owing to the low prices, has reduced stocks at the factories much more rapidly than was expected. Buyers are already finding a difficulty to get their full supplies of favoured brands of South Australian makes; therefore, better rates are now being obtained. Bacon.—Although business has been fairly active, the heavy slump for the live hog has caused factory-cured sides to ease about 1d. per lb. Very little call for Hams, present stock of South Australian cured being in excess of requirements. Honey.—The quality offering is only medium, which meets with very little enquiry. Almonds are moving freely at quite up to former quotations.

Carcase Pork and Veal Now that winter conditions have set in the trade operate freely at the Friday markets for their requirements but in Pork, farmers are unwise to hold on to the animal until the weights are excessive, for bright handy-sized shop porkers weighing from 60 to 90 ℔ sell readily at top rates but heavy and rough sorts have to submit to considerably lower prices Prime Vealers also dressed Poultry meet with good sale .

Live Poultry The pleasing feature in this line has been the steady improvement in the quality of the birds penned and if farmers keep this up good prices must result

Market Quotations of the Day

Wheat —At Port Adelaide shipping parcels 2/11½ to 3 per bushel of 60 ℔

Flour —City brands £7 10/ country £7 to £7 5

Bran —7d to 7½d **Pollard** 7½d to 8d per bushel of 20 ℔

Oats —Local Algerian and Dun 1 5 to 1 6 White Champions 1 10 (nominal) per bushel 40 ℔

Barley Malting, 2/6 to 3 Cape up to 2/3 (nominal) per bushel 50 ℔

Chaff —£2 10/ to £2/12/6 per ton of 2 240 ℔ bags in f o b at Port Adelaide

Potatoes Locals £2/10/ Gambiers £2/2 6 to £2/5/ per 2,240 ℔ f o b Port Adelaide

Onions Locals and Gambiers £3 per 2 240 ℔

Butter – Factory creamery and choice separators 10½d to 1s 0½d best dairies and fair separators 9d to 10d well-graded store lines 6½d to 7½d pastry and mixed lots 5½d to 6d imported bulk 8d to 9d fair to choice

Cheese —Factory make 5d to 5¾d per ℔

Bacon —Factory-cured sides 7d to 7½d farm flitches 6½d to 7d per ℔

Hams —S A factory 9d to 10d per ℔

Eggs Loose 1 4 in casks f o b 1/6 per doz

Lard —In bladders, 5d tins, 4½d per ℔

Honey 2½d prime clear extracted in 60-℔ tins Beeswax 1/2 per ℔

Almonds Soft shells 4½d kernels 8¾d per ℔

Carcase Meat Good shop porkers sell from 3¾d to 4¾d heavy weights and rough sorts 2½d to 3½d prime veal worth 3d to 3½d medium 2d to 3d

Dressed Poultry —Fowls and turkeys, 5d to 6d per ℔

Live Poultry Prime table roosters realise 1 10 to 2 2 each good hens and fair-conditioned cockerels 1/3 to 1/9 poor and light 1/1 to 1/2 ducks 1/9 to 2/9 geese, 3/6 to 4/6 pigeons 6d turkeys 4½d to 6½d per ℔ live weight for fair to good table sorts

Above quotations unless when otherwise specified, are duty paid values on imported lines Grain Flour, and Forage for export are f o b prices at Port Adelaide Dairy products are City Auction Mart rates In Grain, Chaff and Potatoes sacks are included, but weighed as produce Packages free with bulk Butter and Cheese

GRAIN AUCTIONS.

Dalgety & Co Limited, report on May 31 1904

Wheat —The European markets are keeping very steady, although the quantity afloat is unprecedentedly large There is an absence of speculative business Locally, wheat still only offers in limited quantities but more disposition is now manifested by farmers to accept ruling rates in view of there being little prospect of an early improvement in values During the week we have realised 3/0¼ to 3/0½ on trucks Port Adelaide, for f a q lots but these may now be considered extreme values, as 3/ is now buyers' idea of price. The demand for off lots varies according to millers' requirements, which at present are small. Good milling fetches 2/10½ to 2/11½: fair, 2/9 to 2/10; fowls' wheat, 2/6 to 2/6.

Oats.—The outlet is restricted. Good Algerians sell from 1/5 to 1/6; fair feed, 1/4½ to 1/5; White Champions, 1/10 to 1/10½.

Barley.—Good malting meets with slow sale from 2/3 to 2/4; feed, English, 1/11 to 2/1; good Cape, nominally, 1/10 to 1/10½.

Chaff.—The trade is very dull. Good wheaten chaff sells from 33/ to 34/ on trucks Adelaide. Hay is worth 37/6 to 40/ per ton, but sellers are few.

Potatoes.—Good quantities continue to come forward from the South-East, and prices rule lower. Good Redskins sell from 40/ to 42/6; inferior, 30/ to 37/6; Snowflakes, 42/ to 43/.

Maize.—Fair quantities are selling for feeding purposes from 2/6 to 2/9.

Peas.—Field peas sell from 2/9 to 2/10.

MONTHLY RAINFALL.

The following table shows the rainfall for the month of May, 1904:—

Adelaide	3·00	Manoora	1·10	Echunga	3·79
Hawker	0·60	Hoyleton	1·22	Macclesfield	3·51
Cradock	0·26	Balaklava	1·13	Meadows	3·78
Wilson	0·33	Port Wakefield	1·81	Strathalbyn	1·81
Gordon	0·31	Saddleworth	0·98	Callington	1·48
Quorn	0·29	Marrabel	1·16	Langhorne's Bridge	2·05
Port Augusta	0·20	Riverton	1·15	Milang	2·03
Port Germein	0·90	Tarlee	1·62	Wallaroo	1·24
Port Pirie	1·25	Stockport	1·37	Kadina	1·37
Crystal Brook	1·00	Hamley Bridge	1·37	Moonta	1·61
Port Broughton	1·13	Kapunda	1·31	Green's Plains	1·16
Bute	1·03	Freeling	1·49	Maitland	1·94
Hammond	0·03	Stockwell	1·15	Ardrossan	1·61
Bruce	0·47	Nuriootpa	1·59	Port Victoria	1·30
Wilmington	0·94	Angaston	1·27	Curramulka	2·45
Melrose	1·45	Tanunda	1·33	Minlaton	1·17
Booleroo Centre	1·27	Lyndoch	1·68	Stansbury	0·96
Wirrabara	1·10	Mallala	1·53	Warooka	1·88
Appila	1·08	Roseworthy	1·50	Yorketown	2·63
Laura	0·97	Gawler	1·82	Edithburg	1·63
Caltowie	0·83	Smithfield	1·23	Fowler's Bay	0·81
Jamestown	1·38	Two Wells	1·38	Streaky Bay	1·00
Gladstone	1·30	Virginia	0·99	Port Elliston	0·84
Georgetown	1·23	Salisbury	1·67	Port Lincoln	2·00
Narridy	1·31	Tea Tree Gully	2·74	Cowell	1·20
Redhill	1·13	Magill	3·61	Queenscliffe	3·37
Koolunga	1·30	Mitcham	3·14	Port Elliot	3·52
Carrieton	0·57	Crafers	4·85	Goolwa	3·53
Eurelia	1·00	Clarendon	5·51	Meningie	2·93
Johnsburg	0·43	Morphett Vale	2·75	Kingston	2·44
Orroroo	0·80	Noarlunga	3·01	Robe	4·19
Black Rock	0·81	Willunga	3·26	Beachport	5·43
Petersburg	1·01	Aldinga	2·57	Coonalpyn	1·70
Yongala	1·20	Normanville	3·61	Bordertown	3·00
Terowie	1·01	Yankalilla	4·46	Frances	2·40
Yarcowie	0·86	Eudunda	0·73	Naracoorte	2·80
Hallett	1·68	Truro	1·05	Lucindale	2·45
Mt. Bryan	0·76	Palmer	0·96	Penola	2·58
Burra	0·75	Mount Pleasant	1·54	Millicent	4·50
Snowtown	1·21	Blumberg	2·25	Mount Gambier	4·70
Brinkworth	1·35	Gumeracha	2·57	Wellington	1·97
Blyth	1·29	Lobethal	2·90	Murray Bridge	1·11
Clare	1·26	Woodside	2·69	Mannum	0·93
Mintaro Central	1·36	Hahndorf	2·42	Morgan	0·27
Watervale	1·65	Nairne	2·66	Overland Corner	0·79
Auburn	1·45	Mount Barker	2·74	Renmark	0·51

AGRICULTURAL BUREAU CONFERENCE.

SOUTH-EASTERN BRANCHES.

The Annual Conference of South-Eastern Branches of the Agricultural Bureau was held at Bordertown on Thursday, April 7. Mr. W. E. Fisher (Chairman of the Tatiara Branch) presided, and the following delegates were present:—Naracoorte Branch—Messrs. Forster, Schinckel, and Duffield. Kingston—Messrs. Wight and Redman. Mount Gambier—Mr. Ruwoldt. Millicent—Messrs. Stewart and Mutton. Tatiara—Messrs. Fisher, Stanton, Penny, Killmeir, Motem, Saxon, Makin, Rankine, Wiese, Reschke, and Bond. Messrs. R. Caldwell and T. E. Yelland represented the Council of Agriculture, and a number of visitors also attended.

EXHIBITS.

A splendid collection of exhibits was tabled by the members of the different Branches. These included fresh and dried fruits, preserves, home-made bread, butter candles, sauces, etc., various wheats and vegetables, wattle bark (chopped and ground), and other products.

The Chairman, in his opening remarks, referred to the work done by the Agricultural Bureau, and regretted that so many members were not alive to their duty. He knew that in some quarters the Bureau meetings were ridiculed, but he could say for himself that the interchange of ideas, which was the main object of their meetings, had been of considerable benefit to many.

BRANDING STOCK.

Mr. T. Redman, of Kingston Branch, read a paper on this subject, similar to that published in the report of the Kingston Branch in February issue, page 413. He strongly advocated the re-enactment of the provisions of clauses 26 and 27 of the Brands Act of 1878. These clauses provided that persons in charge of travelling stock must possess a waybill or delivery note, signed by the owner or his representative, accurately describing the stock and their brands. Any magistrate, police officer, or overseer of runs could demand to see this waybill, and if the stock did not answer to the description they could be impounded, and the person in charge would be liable to a heavy penalty. Such a clause would be the most effective means of tracing stolen stock, and would quickly put an end to sheepstealing, which was only too frequent in the South-East. He could not see that any hardship was entailed on the owner or drover in carrying a proper waybill for travelling stock. In regard to branding, he considered a system of registered earmarks much preferable to the brands on the wool.

Considerable discussion ensued. Several of those who spoke had experienced losses of sheep, and they were unanimous in supporting Mr. Redman's paper. It was finally resolved that the paper be forwarded to the Council of Agriculture with a recommendation that the Brands Act be amended to include clauses 26 and 27 of the repealed Act of 1878, with the exception of the requirement that the person in charge should certify to the correct number of the mob.

PRODUCING INTERESTS.

Mr. Caldwell gave an address dealing with various phases of agricultural pursuits. The advances of late years were referred to. The necessity for being up to date both in their methods and also in the stock they bred and kept was emphasised. The practice of fallowing had much to commend it, and he was sure the South could learn a lesson in this respect from the North. The prospects before the frozen meat trade were good, and he thought there was room for considerable development in the apple export trade. He was sure that there were large areas of land in the South-East as well adapted to apple-growing as the land in the Mount Lofty Ranges.

Some discussion on fallowing took place. Mr. Rankine found he could grow double the crop on fallow land as on hay or stubble land, while Mr. G. Milne stated that he had better crops on land not fallowed. At a later stage a resolution to the effect that in the opinion of members fallowing was desirable to secure a good crop of wheat was carried

BAGS AS WHEAT.

The Chairman initiated a discussion on the practice of buyers in purchasing wheat, "bags in." Many farmers thought they were being unfairly dealt with, as they paid from 5s. 6d. to 6s. 6d. per dozen for wheat sacks, but when sold as wheat the bags represented only about 1½d.

In the discussion which followed, Mr. G. Milne said he thought a good deal more was made out of this question than there was any need. In buying wheat the merchant had to consider all costs, and whichever method was adopted, the farmer had to pay for the bag. As a matter of fact, the farmer actually got more under the present system than he would if the wheat was bought apart from the bags. Mr. Yelland agreed with Mr. Milne. He pointed out that the wheat must finally be sold at gross weight, and it was best for all concerned that the same system should be adopted right through. He quoted figures to show that the farmer would not profit by a change to the old method. Most of the speakers seemed to agree that nothing was to be gained by asking the merchants to pay for the bags separately

POTATO GROWING.

Mr. Ruwoldt made a few remarks on this subject, and referred to his experiments with different kinds of potatoes. Some varieties obtained from New Zealand had done remarkably well, other imported kinds had also done well. The blister on potatoes had done a lot of damage around Mount Gambier, and rotation of crops was necessary. Fertilisers had been tried, but direct manuring had not been very successful He found it best to manure a wheat crop with bonedust and super, and grow a crop of potatoes afterwards. He found the imported seed potatoes less liable to damage by water blister than local seed He thought it an advantage to get seed from a cooler district than that where it was to be grown.

CLOSER SETTLEMENT.

By request, Mr. A. H. Peake, M.P , gave an address on this subject, and referred particularly to the necessity for cutting up land in the South-East for closer settlement. The bulk of the best land was held by a few men, and it would undoubtedly be to the best interests of the State if this could be made available for settlement. They had in the Naracoorte Estate an illustration of the benefit derived from the subdivision of a large estate purchased by the Government, and in the Morambro Estate the result that followed the cutting up of land by private speculators.

FERTILISERS.

Mr. W. E Fisher read a paper on the use of fertilisers. The benefit of the seed and fertiliser drill had been most marked. Farms that had been rendered almost valueless by constant cropping were now very profitable, returning good crops of cereals and a greater growth of pasture afterwards. Large landowners who made a practice of having some of the land cultivated on the share system had noticed the marked increase in the pasture after a few crops had been grown with the aid of manures. The farmer is often perplexed to know what fertiliser to use, there being so many different brands, and sometimes was tempted to buy the manure costing least, though it is not unlikely to be the dearest in the long run He preferred bone super for their district, as, in his opinion, the purely water-soluble phosphates caused too rapid a growth at the start, and unless plenty of moisture was available the result was often disappointing. While bone super contained sufficient water-soluble phosphate to give the crop a good start, it also consisted to a fair extent of partly dissolved bone, which becomes gradually available, and keeps the plant going. Another point in doubt was the best quantity of manure to apply per acre, but he thought every farmer would have to test that for himself, as the results would vary according to soil and climatic conditions. They must also remember that the land should be thoroughly prepared for cropping; slovenly cultivation would not pay them.

Considerable discussion ensued. most speakers agreeing with the paper. Mr. Schinckel had best results on the average from bone super, while Mr. Yelland advocated mixing bonedust and mineral super. Generally, about 80 lb. per acre appears to be the most profitable dressing to apply in this district.

POULTRY.

Mr Yelland gave a short address on poultry The fact that the value of poultry products exported from South Australia last year amounted to £120,000 was evidence that this by-product of the farm was one worth cultivating. He knew of a number of instances where, during the dry years in the North, the farmers had been almost dependent upon the returns from their fowls Proper houses, regular attention, clean water, good food and cleanliness were a few of the main factors in successful work with poultry Early chicks were most profitable for laying purposes He would advise hatching the chicks out in August Farmers could greatly improve their fowls by procuring a good, pure-bred rooster of a laying strain, and mating him with the best of their hens He preferred the Wyandotte for the farmer, though both the Orpingtons and Plymouth Rocks were good all-round birds The poultry industry should receive more encouragement from the Government

NEXT CONFERENCE.

It was decided that the next Conference be held at Naracoorte in 1905

VOTE OF THANKS.

A vote of thanks to those who had taken part closed the proceedings

AGRICULTURAL BUREAU REPORTS.

Watervale, May 23.

Present—Messrs. Croft (chair), Ashton, Scovell Hunter, Perrin, and Castine (Hon. Sec).

Second Crop Pears.—Mr. G. Hunter tabled samples of second crop pears, picked that day. The fruit was rather hard, but well grown, and of fair flavour.

Mixed Farming —Mr H Ashton read a short paper on growing a variety of crops on small holdings On such farm he thought it unwise to grow only wheat, as the owner must depend upon his cows, pigs, and poultry for a good portion of his income Crops producing both corn and fodder should be grown Oats and Cape barley can be stripped before the sap has gone from the straw, which can afterwards be cut for feeding purposes When stacking it is a good plan to add molasses and salt to each load of straw Treated in this way he found the cattle ate the straw as readily as the best of hay Peas were of great value for feeding He cut the crop with an ordinary mower, raked it together, and stacked it until January The peas were then trodden out with horses, and winnowed, being afterwards fed to poultry and pigs, which fattened rapidly on them Where the land was not suitable for lucerne he would grow sorghum for summer fodder A paddock of 11 acres, drilled in with 9 lb seed and 2 bushels of slack lime per acre, kept seven cows for several months He found lime gave better results than super in this instance Rape had not been a success this season, but in four years out of five it might be grown with profit

Forster, May 21.

Present—Messrs W Johns (chair), Retallack, Schenscher F and J Johns (Hon Sec), and three visitors

Land Drifting Mr Schenscher read a paper on stopping sandy lands from drifting Most farmers in this locality have had more or less of their land ruined by drifts, which, with ordinary care could have been prevented Overstocking and overcropping were the most common causes of the trouble Through "takeall," patches will commence to drift These should be manured with phosphates and stable manure and cropped with oats which will flourish on "takeall' patches If left till ripe enough seed will fall to ensure a self-sown outcrop the following year The straw should be allowed to decay where it grew The land should then be rested for a few years when it can again be put into wheat It is doubtful whether it is wise to run sheep on sandy land during the summer months, as they always herd together in the hot weather to protect themselves from flies, and trample the soil to dust which soon commences to drift A few loads of straw or cocky chaff spread on such places will overcome the difficulty but if the sand is allowed to drift until large holes have been excavated there is hardly any cure Marram grass has been tried here, but is not very successful It should, however be worth while trying the blue lupin, which had done so well on the Lower Murray sands

Johnsburg, April 30.

Present—Messrs Chalmers (chair) Hombsch, Potter, Masters, Luckraft McRitchie, and Johnson (Hon Sec), and one visitor

West Coast Lands —Mr Davies gave an interesting description of the land west of Spencer's Gulf. He thought that what was known as the West Coast would eventually carry a large population as much of it had a good rainfall, and, with the aid of fertilisers would produce profitable cereal crops

Wepowie, April 26.

Present—Messrs. Gray (chair), Gale, Smith, Orrock, Bishop, and Halliday (Hon. Sec.), and three visitors.

Pickling Seed Wheat.—Considerable discussion on this subject took place. It was generally agreed that half a pound of bluestone to the bag of seed was sufficient, but difference of opinion existed as to the best way to pickle the seed.

Membership.—Suggestions from Wilmington Branch in reference to alterations in membership rules were unanimously approved.

Bowhill, April 23.

Present—Messrs. Norman (chair), J. Waters, J. Waters, jun., Weyland, Johnson, Burton, and Whitfield (Hon. Sec.). and one visitor.

Management of Farm Horses.—Mr. Burton read a paper on this subject. He considered it false economy to let horses get low in condition towards the end of the summer, as it took more food to get back their condition than it did to keep them in condition. A team of five horses in good condition would if properly looked after do more work than seven half-fed animals. Regular feeding and grooming were necessary to the wellbeing of working stock. He preferred mixed hay to pure wheaten hay, while oats, used judiciously, were, of course, good. As the horse was sensitive to cold, a covering during the midwinter months would prove beneficial. Clean water was essential, though it need not be absolutely fresh. Brackish water did not, of course, quench the thirst like fresh water. The majority of horses did not, in his opinion, get as much salt in their food as they required. With regard to sore shoulders, this was often due to carelessness and neglect. The collars should fit properly, and should be attended to at regular intervals by a saddler. Grooming should not be neglected during the period the horses are working hard.

Mount Remarkable, April 28.

Present—Messrs. Challenger (chair), Jorgensen, Giles, G. P. and T. P. Yates, Foot, Morrell, Casley, and O'Connell (Hon. Sec.).

Membership.—Suggestions from Wilmington Branch were considered, and it was resolved that as great difficulty was experienced in keeping this Branch up to the full complement of members it was not considered advisable to take an active part in this matter.

Resources of the District.—Mr. T. Casley read a paper on "Our District and its Resources." In his opinion the full capabilities of their district had not yet been realised, largely owing to their isolation, Mount Remarkable being thirty miles from seaboard and from railway. They were inside the rainfall line, and had the Willochra running through the district. That stream ran for a surety in every winter, and millions of gallons of water could easily be conserved for irrigation purposes. The land was second to none in the State for cereals, hay, stock etc. but, unfortunately, one bar to their progress was the use for pastoral purposes only of a very large area of the best land. With a railway and the cutting up of that land a large population could be profitably settled, and the district would rapidly progress. Fruit trees, vines, root crops, and summer fodders could also be profitably grown within a radius of eight miles from Melrose. Dairying was carried on successfully, and the opening of the up-to-date factory would tend to further develop that industry. Pigs already added considerably to the revenue of the farm, and that branch would receive still more attention now that dairying was going ahead. In poultry they were already making a good show, but with better means of reaching the market there would quickly be rapid development in that line. They could also supply timber for railway sleepers, fencing, buildings, and for firewood in unlimited quantities. All that was necessary was better facilities for getting produce to markets and the closer settlement of the large estates in the neighbourhood. Mr. Casley's paper was generally supported by those present.

Paskeville, April 30.

Present—Messrs. H. F. Koch (chair). H. Koch, Westphall, J. C. and S. R. Price, Meier, and O'Grady (Hon. Sec.).

Rabbits.—Members reported rabbits to be increasing in the district, but in the neighbouring districts of Kadina and Clinton they were much more numerous, and it was agreed that not much good could be accomplished while the rabbits came in in hundreds from the neighbouring districts. The Chairman suggested that the residents should join forces for a week and eradicate the rabbits, treating different portions of the district separately.

Mice.—The Chairman reported successful results from use of mouse poison, mixed with oatmeal, and placed in lids of tins, etc., in the wheat heaps and haystacks. Each time he had set out poison in this way he found hundreds of dead mice.

Wet v. Dry Seeding.—Most of the members were opposed to continuing seeding operations while the ground was wet, but it was agreed that it was better to have the soil a bit moist than too dry.

Bunt.—The question was raised as to why early varieties of wheat seemed more susceptible to bunt than the later kinds. The Hon. Secretary suggested that as the early varieties were usually reaped as soon as ripe, the smut balls were also gathered in uninjured: whereas in the later wheats, standing longer after ripening, the spores were more liable to injury from exposure to the weather, especially should light showers occur. This idea was not, however, generally supported by members. Some members considered two gallons of pickle sufficient for a bag of seed, but the majority thought three gallons would be required. The Hon. Secretary stated that he intended to try formalin this year, in comparison with bluestone

Bute, April 26.

Present—Messrs. A. Schroeter (chair), H. Schroeter, W H and A. Sharman, Hamdorf, Stevens, Buchanan, McCormack, Gitsham, Barnes, and Masters (Hon. Sec.).

Membership. Suggested alterations in membership rules were discussed at length, and it was resolved that the proposals of Wilmington Branch be supported. One member opposed this, as he considered the adoption of the provision for honorary members would meet the case.

Bunt.—Mr. McCormack raised the question of the use of different strengths of bluestone pickle for early and late wheats, and suggested that the late wheats, being usually softer in the grain, would be more susceptible to injury than the early kinds. The Chairman thought they could safely use stronger pickle with the early wheats. He never pickled when sowing in dry land, but after rain he used 8 oz. or less, according to variety and condition of the seed.

Nantawarra, April 27.

Present—Messrs. Dixon (chair), E. J. and A. F. Herbert, Belling, Dall, Bierworth, R. and G. Nicholls (Hon. Sec.).

Farming.—Paper read by Mr. J. G. Preiss at Mannum Conference was discussed. Members agreed with the writer that it was profitable to grow oats after wheat, and they also pointed out that a much better growth of feed followed an oat crop.

Formalin for Pickling Wheat.—It was decided that the Hon. Secretary obtain a supply of Schering's formalin, as members intend to test its value as a preventive of black rust and bunt..

Green Feed.—Mr. Dixon reported that he had sown a paddock of 60 acres for feed for [illegible]. Ten acres were sown to rape, 10 acres to kale, and the balance to oats and barley.

Watervale, April 25.

Present—Messrs. C. A. Sobels (chair), E. E. Sobels, Ashton, Holder, Ward. Perrin, Scovell, Treloar, Hunter, Solly, Castine (Hon. Sec.), and one visitor.

Membership.—Members approved of alterations in membership rules proposed by Wilmington Branch, and also favoured increasing the limit to 20.

Driving Horses.—Mr. J. Ward read a short paper on this subject. Judging by the way some drivers yell at their horses, they must be under the impression that they are deaf. It was not uncommon to hear a driver speaking to his animals in a voice resembling a foghorn; this was especially the case with teamsters and ploughmen. There was, however, not the slightest use for so much noise, as the horse was very acute of hearing, even more so than a man. Quiet speaking and gentle handling were far more effective. A boisterous driver will often keep a nervous-tempered horse in a fret, which was more wearing than actual work. Many young horses are ruined by bad treatment. Some drivers do not know how to use the whip. Often they will flog a horse without reason. The less the whip was used the better. The greatest number of cases of "laziness" were caused by want of proper food and good driving.

Kingscote, April 11.

Present—Messrs. Turner (chair), Bell, Carter, Nash, Melville, Wright, Olds, Ayliffe, Bates, Davis, and Cook (Hon. Sec.).

Wheatgrowing.—Mr. Olds read a short paper on his experience in growing wheat in the Hundreds of Tickera and Wokurna, and recommended Marshall's No. 3 and Allora as rust-resisting wheats. The latter was weak-strawed and lodged badly, so that it would not be wise to sow it largely; it was a good hay wheat. Mr. Davis found that as a rule the early-maturing wheat suffered very little from rust. Considerable discussion on rust took place. It was decided to endeavour to secure an increase of the duty on barley.

Smut.—In reply to question of pickling oats to prevent smut, the Chairman considered pickling would be of great benefit, but care must be taken to dry the oats carefully, or they would not run through the drill. Mr. Davis cautioned members against drying the oats with lime, as he had found it a great mistake.

Davenport, April 24.

Present—Messrs. Hewitson (chair), Hodshon, Holdsworth, Welby, Pybus, McDowell, Roberts, and Lecky (Hon. Sec.).

Membership.—Members do not approve of suggested alteration in membership rules. The difficulty in this locality is to keep the roll full.

The Bureau.—Mr. Holdsworth read a short paper on "Our Bureau: Its Aims and Work." He took it that each Branch of the Bureau should be a centre of distribution of information of a practical kind for the benefit of those following the producing interests. Each member of a Branch should regard it as his due to do all in his power to carry into effect the object of the Bureau. He thought that the writing of papers and tabling of examples of products should not be the beginning and end of their programme. He thought they should go further in their efforts to make the Bureau helpful. They should endeavour to obtain a library of literature on agriculture and kindred subjects, have quarterly lectures on the fauna, soils, and capabilities of the district, arrange for visits by the experts attached to the Department, etc. The members themselves should be asked to give practical hints on farm buildings, dam-sinking, care of stock, cultivation of crops, etc. Then they should arrange to visit the holding of one of the members, say, once a quarter. Mr. Pybus thought the Government might assist the Branches by voting a special sum to institutes for the purchase of works of reference on agriculture and kindred subjects. Mr. Roberts thought it would be better for each Branch to have its own small library, and a system of interchange of books between neighbouring Branches might be arranged.

Wilmington, April 27.

PRESENT—Messrs. Robertson (chair), Broadbent, McLeod, Bischof, Lauterbach, Schuppan, Zimmerman, and Payne (Hon. Sec.), and one visitor.

QUESTION BOX.—Various questions were handed in by members. Cape oats were regarded as the best to sow for general purposes in the North, and the best soil should be selected for the oat crop. The reason why "flatboned" horses were considered preferable to "round-boned" horses could not be answered by members, who would like to hear from other Branches on this point. The general opinion of members was that the spores of smut or bunt retained their vitality for some time in the soil. In reply to question of best description of cheap, neat, durable farm gates, sawn hardwood, well bolted, was preferred, if iron gates were beyond the means of the farmer.

GREEN FODDER.—Mr. F. H. Lehmann, of Mount Brown, tabled vigorous growths of Bearded, Pearl, and Cocksfoot millets. These were grown with the natural rainfall, the Cocksfoot millet being the most promising.

Meadows, April 30.

PRESENT Messrs. Ellis (chair), Brooks, Stone, Pearson, Catt, and Robinson (Hon. Sec.), and one visitor.

HON. SECRETARY.—Mr. Robinson tendered his resignation as Hon. Secretary and member of the Branch. Mr. Cecil Stone was appointed to the vacant office.

HOMESTEAD MEETINGS.—It was decided that it was advisable to hold homestead meetings occasionally, and Mr. Stone's invitation to meet at his residence at Bull's Creek was accepted. Considerable discussion on the ravages of codlin moth took place.

Golden Grove, April 29.

PRESENT Messrs. Milne (chair), McPharlin, Harper, Ross, Angove, White, Buder, N. J. and A. D. Robertson (Hon. Sec.).

MEMBERSHIP. This Branch does not approve of alterations in membership rules, proposed by Wilmington Branch.

SHEEP ON THE FARM. Mr. S. A. Milne read a paper on this subject. Since the farmer began to use fertilisers for his cereal crops he has not only been getting a more profitable return from the crop, but the fertility of the land has so increased that after the crop is cut there is usually an abundance of feed where formerly there was hardly enough for a rabbit. Besides this, the feed was much better in quality, and he believed the marked increase of small flocks on farms was due mainly to this. He also thought that in a few years the farmer who did not keep sheep would be as rare as the one that did not use fertilisers. The one great drawback that confronts many farmers is the lack of a permanent water supply, without which it would never pay to keep sheep. When the farmer decides to keep sheep he must make up his mind what class of flock will be most profitable. Whether he will devote his time to wool, to fattening, or to breeding lambs for export. Whatever he decides upon he should get good animals of their class. To the beginner most sheep of a breed will appear to be very similar, though the experienced man will detect great differences, and it will often rest on their ability to judge the quality of the sheep they were buying whether their deal was a success or otherwise. The new chum will almost certainly make a few mistakes at the beginning, but he quickly learns by experience. In regard to class of stock, he thought the breeding of lambs most profitable to the farmer. Farmers' wool was not of the best, as when sheep are kept on the fallows they get very dirty, and when feeding on the stubbles the wool gets burry. Fattening sheep was too risky for the average farmer, but in breeding lambs he has three strings to his bow. He buys the ewe off shears, gets a lamb from her, also a clip of wool, and at the end of twelve months, when she has got used to the pasture, she quickly gets in prime condition for the butcher. Having determined that lamb-breeding is most profitable the farmer must decide how he is going to breed them. The class of country will to a large extent settle this; but, taking everything into consideration, he thought the Merino ewe mated to Shropshire or Dorset Horn ram would be best. Too much stress cannot be laid on the fact that constitution is the most important factor in lamb-breeding. Select large-framed, strong-woolled Merino ewes, of strong constitution, and mate them with a deep-shouldered, broad-rumped Shropshire ram, and the result was almost certain to be a vigorous type of lamb. Unless the parents were strong and robust, they would not get vigorous-growing, quick-maturing lambs, which were essential. It was especially important that the sire should be of the best. In buying ewes, he would get six-tooth or eight-tooth ewes from one of the large stations, as they can be bought much cheaper than the farmer can breed them, as a large percentage of lambs cannot be expected until the ewes are three or four years old. In breeding ewes, therefore, the farmer gets nothing but the wool for three seasons, and this would not pay him. Put the rams with the flock in October. He found it paid to yard the sheep at night, as he got a much larger percentage of lambs. For winter lambs, however, this was not of so much importance, as it is only early in the season that the rams do not work freely. He thought it too risky to depend entirely upon the natural pastures, and would grow a little summer and winter feed. Amber cane and Planters' Friend, especially the latter, he found a splendid stand-by for summer and autumn, and the broad-leaf Essex rape for winter. Twenty acres of each would, with the natural herbage, be sufficient for a flock of 250 sheep. The lambs will mature much quicker during the winter months on rape than on grass. Small paddocks were required. For a flock of 250 they need not be more than 40 acres. With small paddocks and frequent changes, the feed will last longer and the sheep do better.

Clare, April 29.

PRESENT—Messrs. W. S. Birks (chair) A. P. Birks, Kelly, Christison, Dolan, Dall, and Greenway (Hon. Sec.)

MEMBERSHIP.—Suggested alterations in membership rules were discussed at length, but decision was postponed until next meeting. Some members thought that it would be better to do away with the limit of 15 now imposed, instead of retiring one-third of the members annually, as proposed,

THE PAST SEASON.—Mr. A. P. Birks read a paper reviewing the harvest results of the past season The wheat crops varied from good to very heavy. Fertilisers had been freely used, and more care had been taken in the selection of the seed especially in giving preference to rust-resisting kinds. Farmers had undoubtedly profited from their previous seasons' experience with rust During the past season the rust had congenial conditions, and the value of a man's standing crop was often entirely a question of the variety of wheat sown. The advent of the combined harvester had also to be noted, and it had demonstrated that by its means the crop was harvested quicker and cheaper than with other classes of machines. The past season had also seen the introduction of seed graders on some farms, and though the operation of grading was rather tedious, he felt convinced that the extra labour would be well repaid, as their seed wheat was becoming very inferior owing to the presence of drake, barley, split grains, and foreign seeds. Malting barley had also been tried this year. Their own experience was not too satisfactory, as they fed the crop off, as with other cereals. The return was 15 bushels per acre, and the price obtained 3s. per bushel, so that with the feed they got the crop was by no means a failure. He was convinced that it was a mistake to feed off barley intended for grain. Excellent prices had been obtained by some growers for their dried apricots, although they could hardly have had a worse season for fungus diseases. Apples had borne a good crop, and in some varieties the quality was also superior. The apple most highly valued by many of them, the Cleopatra, had suffered very much from the effects of the wet summer. Bitter pit was mainly responsible for this. The culls this year in packing for export were in many cases three times as numerous as was usual. Planters would, therefore, do well to give this serious consideration, and he was disposed to think that Dunn's Seedling should be higher up in the list for planting, as it bore well; the fruit was of good quality and remarkably free from disease. Summer pruning had received more attention owing to Mr. Quinn's demonstrations, but it was evident that the growers would have to make a careful study of the season when doing his work, as in many instances the shoots summer pruned had this year made a foot of growth since. One advantage of summer pruning the Rome Beauty apple he noted was that it caused the fruit to colour better, an important point in selling this variety. Vines had done well, producing heavy crops of fruit and unusually strong wood growth. Strange to say, notwithstanding the wet season, they had practically escaped injury by oidium. A more anxious time in drying currants had rarely, if ever, been experienced in this district, and had it not been for the unusually warm weather during the first week in April he doubted whether half the crop would have been gathered. The vintage had probably exceeded in value any previous one in that district, and in spite of the unusually cool summer he believed that with a fair proportion of Shiraz in the make the type of wine this season would commend itself to London buyers.

Booleroo Centre, April 25.

Present—Messrs. Clack (chair), Nottle Albinus, Steven, Miller, Michael, and McMartin (Hon. Sec.), and two visitors.

Best Hay Wheat.—Mr. Nottle had noticed that in *The Journal* Smart's Purple wheat had been recommended for hay. They were growing a wheat under the name of Smart's Early, and he would like to know if that was the same variety.

Horses Eating Wheat.—Some of the members differed from statement in *The Journal* that carbonate of soda was a certain cure for horses that had eaten freely of wheat, as it was not always successful. The Hon. Secretary said he found Ammonium causticum (homœopathic tincture) effective for this as well as for windy colic. In reply to a question, none of the members had heard of horses dying as a result of eating ripe wheat in the chaff.

Oats for Feed.—It was reported that during the past season seven to nine bags of oats per acre had been reaped in this district, and the value of oats for feed was referred to.

Quantity of Manure per Acre.—Members generally used from 70 lb. to 80 lb. of super per acre. Heavier dressings did not appear to give any appreciable increase in the crop. Members were of opinion that it was better not to use the harrows after the drill.

Morchard, April 30.

Present—Messrs. Scriven (chair), Toop, McDougall, Kitto, Reichstein Kirkland, Kupke, and Beck (Hon. Sec.).

Membership.—Members were unanimously in favour of alterations in membership rules suggested by Wilmington Branch, and believe that their adoption would prove highly beneficial to the wellbeing of the Bureau generally.

Sheep on the Farm.—Mr. McDougall read a paper on this subject. He thought every farmer should keep a few sheep, as however small the flock they would more than repay him for his outlay and trouble. For their dry districts he thought the farmer could not do better than purchase the Canowie Merino sheep, as they were very hardy, good wool producers, and of large carcase. A good discussion ensued, and the present high price of ewes and the fear of the results of another drought were admitted to be the principal drawbacks to the extension of the practice of keeping sheep on the farms. Members thought that the export of such large numbers of the best lambs reared each year must prove detrimental in the end to the industry. The pick of the lambs were exported, and the culls often retained for breeding. The depletion of the flocks of the State was also a serious matter, and a tax of 2s. per head on lambs exported, until the natural increase in the number of sheep in the State warranted the development of an export trade, was suggested.

Pickling Seed Wheat.—Members advised the use of the cleanest rain water obtainable for preparing solutions for pickling seed wheat.

Reeves Plains, April 29.

Present—Messrs. Oliver (chair), Worfel, H. and W. Day, Richter, Carroll, and W. H. Day (Hon. Sec.), and three visitors.

Egg-laying Competition.—Considerable discussion took place on the results of the egg-laying competition at Magill, and disappointment was expressed at the financial returns from the fowls.

Kanmantoo, April 29.

Present—Messrs. Lehmann (chair), Hawthorne, Mills, E. R. H., and J. Downing (Hon. Sec.), and one visitor.

Bags as Wheat and Standard Bushel. Mr. W. G. Mills read a paper dealing with these two subjects. One very sore point with most farmers is that of late years they had been compelled to pay up to 6d. for their grain sacks, and sell them with the wheat, etc., at practically 1½d. each. He knew the buyers contended that they allowed for this in fixing the price they could pay for the wheat, but few farmers felt satisfied that that was done, but thought with some reason that it was merely another dodge to squeeze the producer. With wheat varying in price from 6s. to 2s. per bushel, it was very difficult indeed to believe that the buyers took the trouble to value the bags accordingly, and to his mind it would be much more satisfactory to revert to the former plan of buyers giving a price for the wheat and buying the bags, paying according to their condition. He was fully aware that they were not likely to secure that without complete co-operation amongst the farmers, and that unfortunately, seemed almost impossible to obtain. Another bone of contention had to do with the fixing of the f.a.q. standard each season. He could not understand why the Chamber of Commerce was allowed to usurp control of this matter. The British law fixed the bushel at 60 lb. weight, and it seemed to him an unwarrantable act for the buyer to dock the seller if the wheat did not weigh 63 lb. per bushel. He was sure himself that buyers would find it soon paid them if they allowed the farmer an extra price per bushel for wheat over standard, and nothing would do so much to increase the weight of our wheat. This was another evil that only co-operation on the part of the farmers would remedy, and he thought that with a little capital and forethought the farmers could so alter the system of selling grain as to simplify both difficulties, and to benefit both buyer and seller. He would suggest that producers within a radius of ten miles, or more, if necessary, of any railway station, should form themselves into a company, and arrange with the Government to lease some portion of the station yard to them as a grain depot. They could then build for themselves an iron mouse-proof store, to which they could cart the grain as fast as possible straight from the field. That would save the expenditure on sheds and barns on the farm, most of which are very secure harbours for mice and other vermin; would save carting to and loading in and out of the barns, and would enable them to control their own wheat. Being also in a position to offer jointly, say, from 2,000 to 20,000 bags in one line, they would get the best price offering, or could hold if the price did not suit without risk of loss of weight and bags through exposure. This system would also be to the advantage of both shipper and miller, as they could then inspect the whole parcel for themselves, and could send it straight to ship or mill, as best suited them. They would also be sure that both wheat and bags were in better condition than was possible under present conditions. This plan would also benefit the railways, as not only would there be the revenue from the land leased in this way, but the work of handling the harvest would be greatly facilitated, and there would be less risk of a block of traffic. A lengthy discussion ensued. One member pointed out that if Mr. Mills's suggestion were adopted it would be possible to store the wheat in tanks, which would be preferable to bags. Other members agreed that it would be of advantage in doing away with the necessity for purchasing such large stocks of bags.

Fertilisers.—Members favoured the use of super and guano in this district. Not only did the crops benefit, but the crop of grass following was much improved. About 75 lb. per acre of super was considered a fair dressing, and of guano double that amount was necessary

Utera Plains, April 30.

PRESENT—Messrs. R. Deer (chair), James and J. Deer, sen. and jun., West, Hornhardt, Venning, A. R. S. and A. R. Ramsey (Hon. Sec.), and five visitors.

MEMBERSHIP.—Suggested alterations in membership rules were discussed, and a resolution approving of same was carried.

PURCHASE AND PROTECTION OF FARM IMPLEMENTS.—The Hon. Secretary read a paper on this subject. In purchasing implements, he strongly advised the farmer to obtain the best of its kind, as although it may cost more it will prove the cheapest in the long run. He admitted that with many machines so nearly alike it was difficult for the farmer to determine which was best, but he would advise them, where possible, to see the same make machine at work in the field before purchasing. In this connection, their public field trials were of great benefit, as different makers' machines could be seen side by side, and their merits compared and discussed. The care of farm implements was also an important matter, and he knew that implements would last much longer if properly looked after. Then, again, small faults of the maker were often responsible for serious damage. The breakage or wearing of an apparently insignificant bolt or connecting link may cause more important parts of the machine to get out of order; hence the necessity for good work and material in all parts. He was sorry to admit that too often expensive machines, such as strippers, winnowers, etc., were left exposed to the weather without any protection. It was especially important that all implements in which wood was largely employed in the manufacture should be carefully looked after. A shed of some description should be constructed, and when the implements were finished with they should be put under cover. A stone and iron shed with hip roof was best; if a lean-to, care must be taken to give the roof a good pitch. Half a ton of iron would roof a fairly large shed, and he considered that in two years the value of the water caught from the roof would in this district pay for the iron, without taking into consideration the benefits resulting from the protection of the implements. If stone and iron were beyond the farmer's means, a shed built of the best native timber and well thatched, will prove very serviceable, but with thatched sheds there was always the risk of losing implements and shed by fire. Paint was also a great factor in the protection of implements consisting partly of wood. New implements should be painted each year for the first few years, and afterwards every second year. Tires and bolts should receive attention, and any repairs necessary carried out before the machine is put away for the season.

RAINFALL.—Recorded for April at Salt Creek, 1.10 in.; at Utera Plain 0.81 in.

Minlaton, April 23.

PRESENT—Messrs. Correll (chair), H. and J. Martin, Evans, Vanstone, Twartz, R. G. and B. W. Newbold, Anderson, Mayer, A. and J. McKenzie (Hon. Sec.).

PROFIT FROM FOWLS.—Mr. H. Martin read a paper on, "Will it Pay to Feed Fowls on Wheat at 5s. per Bushel?" He reminded members of the discussion on this point last year, when wheat was fetching 5s. per bushel, and most farmers appeared inclined to the belief that it would not pay to use clean wheat for fowls' feed. He determined to test the matter for himself, and, by feeding the fowls at three different times on good wheat he found that a bag lasted about 100 fowls for two weeks. This meant 26 bags for the year, or £27 6s. for food. During the year ended December 31, 1903, his fowls laid 13,434 eggs, and the price received worked out at 9d. per dozen, or a total of £41 2s. 11d., besides which he sold 24 fowls for 1s. each, and killed others for eating. He had, therefore, a little over £14 clear for his trouble of feeding and looking after the fowls. Considerable discussion ensued, and it was unanimously resolved that, in the opinion of this Branch, it will pay to feed fowls on wheat, even at 5s. per bushel, but to secure this result they must be properly looked after.

SHEEP COMPLAINT.—Mr. Vanstone had a number of sheep foundered through feeding in a paddock where several bags of oats per acre had been shaken out by rough weather. Three of the sheep succumbed to the complaint.

Finniss, April 5.

Present Messrs S Collett (chair) T Collett H Langrehr and A E Heuley (Hon Sec) and one visitor

Branch Shows The Hon Secretary and Mr T Collett reported having attended the Bureau Show at Mount Compass and while pleased with the show were rather disappointed at the fact that so much time was devoted to sports Mr Collett regretted that the opportunity was not taken of the presence of so many producers to have considered subjects dealing with agriculture Members reported on proceedings of Strathalbyn Conference

Denial Bay, April 31.

Present—Messrs Smith (chair) Starling Dunnett Lowe G J and W O Gale (Hon Sec) and one visitor

Pickling Wheat Considerable discussion on this subject took place Mr Starling advised pickling on a good floor dissolving ½ lb bluestone in two gallons of water for each bag of grain The Chairman would use the same quantity of bluestone in four gallons of water to the bag Mr Lowe did not favour the use of bluestone His practice was to dip the wheat in ordinary water taking care to wet it thoroughly and then let it dry well before sowing Mr G J Gale advised sowing smutty seed by hand instead of by machine as the latter was likely to break the smut balls and re-infect the seed The Hon Secretary very rarely pickled his wheat but he took care to sow only clean seed He was disposed to agree with Mr Lowe s method as he believed that if the wheat were wetted the spores of smut would germinate and if the wheat were not sown until it was thoroughly dry the smut would die

New Wheats The Chairman believed a number of new wheats were being tried in the district this year and he specially asked members to make a note of time of sowing condition of soil and other data which would help them in reporting on the wheats after harvest

Morgan, April 30.

Present Messrs Windebank (chair) Bruhn Hahn Landner Haupt Hewitt R and H Wohling (Hon Sec)

Cattle Complaint Some discussion on losses from impaction or dry bible took place Two members had noticed cattle in good condition equally as liable as those on dry feed

Mount Bryan East, April 30.

Present Messrs Dunstan (chair) Bryce, Thomas Dare Honan T and E S Wilks (Hon Sec) and several visitors

Preparation of Land for Seeding Mr Dunstan read a short paper on this subject Preparing the land for seeding commenced with fallowing this should be commenced before the grass begins to dry or go to seed It should not be later than the first week in August in this district and if a good covering of grass can be ploughed under it will be all the better A strong and suitable plough and a good team of horses were necessary He would plough 4½ inches to 6 inches deep according to the soil as he found deep ploughing retained the moisture better than shallow ploughing During the summer any weeds that appear should be destroyed by cultivating lightly The fallow should be worked in March and April, before commencing to sow Seeding should not be started too early the first week in May was quite soon enough for this district

Longwood, April 30.

Present—Messrs. T. G. Oinn (chair), E. J. Oinn, Mundy, Smith, Narraway, Nicholls, Vogel, and Hughes (Hon. Sec.). and nine visitors.

Bots.—Mr. Nicholls referred to article in April issue of *Journal of Agriculture*, and stated that his experience in England caused him to agree with the writer in almost every particular, though he thought the bot fly hurts the horse as its behaviour was strong evidence of this.

Bitter Pit.—Mr. Oinn tabled samples of Cleopatra apples picked on February 12, and some gathered that day. The former were only half the size of the latter, and inferior in flavour, though not shrivelled; they were also quite free from pit, whilst those picked on the morning of the meeting were badly pitted.

Membership.—Members do not favour any alteration in membership rules. The first suggestion of Wilmington Branch was tried some years ago, and found unworkable; while the other two have been in practice for years with every success.

Longwood Show.—The show of products held locally proved a great success, the exhibits of fruit being particularly good, and although not so numerous, were stated by several visitors to have been equal to any exhibited at Adelaide.

Loss in Weight of Bonedust.—The Hon. Secretary stated that on March 12 he purchased a cwt. bag of bonedust for the purpose of testing the loss of weight by the evaporation of moisture when stored in a hot shed. When purchased the bag of bonedust weighed 111¼ lb. On March 25 it weighed 108¼ lb. and on April 30 107¼ lb., showing a loss of 4 lb in seven weeks.

Eudunda, April 25.

Present—Messrs. Gosling (chair), Martin, J. and E. T. Pfitzner, Kluske, and von Bertouch.

Membership.—Suggested alterations in membership rules were discussed, but members came to the conclusion that it would be better to retain the present rules.

Education for Farmers' Sons and Daughters.—Mr. W. H. Marshall forwarded a paper on this subject. He suggested the establishment by the Department of Agriculture in country districts of schools or classes of short duration, where lectures on subjects relating to the practical and scientific development of agriculture and allied industries could be given by competent men They should also endeavour to establish, in connection with the Branches, agricultural libraries, suitable textbooks being selected and supplied by the Department.

Petina, April 30.

Present—Messrs. W. Penna (chair), R. Penna, Cocks Fiddaman, Lutz Wallschuttzsky, and Norton, and five visitors.

Hon. Secretary.—Mr. Symons tendered his resignation, owing to inability to attend meetings, and Mr. E. H. Fiddaman was elected to fill the vacant office.

Membership.—Suggestions from Wilmington Branch were discussed, but no decision arrived at. It was, however, resolved to notify absent members that unless they attend meetings their names will be struck off the roll.

Mundoora, April 29.

Present—Messrs. Aitchison (chair), Owens, Loveridge, Dick, Shearer, Mildren, Tonkin, Sutton, Angley, and Gardiner (Hon. Sec.).

Treeplanting.—It was decided that, subject to the consent of the District Council being obtained, the Branch undertake the planting of the main street of the township.

Rhine Villa, April 29.

Present—Messrs. G. A. Payne (chair), F. r., and H. W. Payne, Mickan, W. T. and J. Vigar (Hon. Sec.).

Membership.—Wilmington suggestions for alterations in membership rules were endorsed by members.

Sheep on the Farm.—Mr. H. W. Payne read a paper on "Will Sheep Pay at Present Prices?" There was no doubt that sheep were at present fetching more than their true commercial value, and the question arose as to whether it would pay to buy sheep for re-stocking the pastoral areas. If a man has a large area of country, with abundance of feed and water, he thought it would pay him better to purchase good breeding ewes, or even young wethers, now than to wait for a fall in prices, as with the present scarcity of sheep he could see no reason for expecting any material fall in prices. The sheep purchased at high rates recently and sent north will not be placed on the market at reduced prices, and from now on till after shearing there would be fewer sheep sent from the stations. Should the season continue favourable in the pastoral areas, there must continue a strong demand for breeding ewes and young sheep after shearing. If the present season is late and rather dry there may be a small reduction in price, and he would not advise small holders to buy dry sheep after shearing to sell again later on. The price towards the end of the year would largely depend upon the season in the upper pastoral areas. A good season would cause hardening, a bad one a considerable fall in prices. Most of the members thought sheep too high in price to warrant farmers buying in other than exceptional circumstances. The Chairman thought they were too far from the railway to touch the fat lamb trade, as the lambs would deteriorate too much on the long journey by road. The Hon. Secretary thought the Dorset Horn ram preferable to the Shropshire for crossing with the Merino, as they would get as good a lamb and better wool.

Elbow Hill, May 5

Present- Messrs. H. Dunn (chair), Wake, J. and B Ward, Pike, Wills, Spence, Hay, and G. C. Dunn (Hon. Sec.). and three visitors.

Feeding Horses.—Discussion on this subject took place. Mr. Wills thought pollard and cocky chaff the cheapest food for working horses, other members had horses work well on a mixture of wheat, pollard, and chaff The Chairman considered oats the best, and at present prices, the cheapest corn

Port Germein, May 9.

Present—Messrs. Stone (chair), Blesing, Holman, Smith, Hillam, and Basford (Hon. Sec.).

Membership.—Alterations in membership rules, suggested by Wilmington Branch, were discussed at length, and, with the exception of the provision that candidates might propose themselves for election, they were unanimously approved. It was decided to establish a question box in the township, so that non-members can submit questions on agricultural subjects.

Walkerie, April 30.

Present—Messrs. Rowe (chair), Blizard, Perry, Rogers, Starr, Allen, Tuck, Burrows, Jones, and Green (Hon. Sec.), and two visitors.

Annual Report.--Ten meetings have been held during the year, with an average attendance of nine members. One paper was read. two pruning demonstrations held, and a very successful show of dried fruits and home industries arranged.

Amyton, April 28.

Present—Messrs. Thomas (chair), Gray, Kelly, Wheadon, T. and W. Gum, Hughes, Mullett (Hon. Sec.), and two visitors.

Membership.—Alterations in membership rules suggested by Wilmington Branch were discussed and unanimously approved.

Stray Notes on Wheat.—Mr. John Ormiston forwarded paper on this subject. To grow wheat successfully in this and the adjoining districts outside Goyder's line of rainfall would tax the efforts of the best of farmers in some seasons. He had seen land on which great trouble was spent in getting it ready for the crop to produce indifferent returns, while other crops put in with very little care or method had yielded surprisingly well. He had also seen this same country produce vast quantities of wheat that could not be surpassed for quality in any wheatgrowing country. There was no doubt that too often sufficient attention was not given by the farmer to the preparation of the grain for market. Splendid samples were often rendered inferior through lack of care in cleaning, smut balls, chaff, and other objectionable matter being left in the wheat, with the result that the buyer docks the seller. He had seen a considerable sprinkling of bunt balls in wheat that would otherwise have been a first-class sample, and which could, with a little trouble, have been blown out in winnowing. He was well aware that the farmers had their hands pretty well full at harvest time, and probably did not give as much attention as they should to one of the most important branches of the harvesting operations. They may perhaps have been disinclined to incur expense on the extra labour. Whatever the cause, he was convinced they lost in the end by not cleaning their wheat properly. In respect to the question of docking, he knew there was a strong feeling amongst farmers. He thought, however, the man who was docked for wheat under standard had no more reason for complaint than the man with over-standard wheat who gets only market rates. Merchants buying parcels themselves might be inclined to pay extra for heavier samples, but it would be futile to expect them to delegate that power to their agents, as, in his opinion, they had enough to do now to restrain the zeal of their agents. There were so many contingencies already to be taken into account in determining the value of grain. There was the absence or otherwise of chaff, smut, and other objectionable matter, the presence of shrivelled grain, which would give a preponderance of bran, wheat injured by rain before reaping or by being cut before mature with the binder, resulting in discolouration, and also in imparting a heated and fermented aroma to the wheat. Then the "drop" of the grain into the testing measure would affect the weight per bushel according as it was done. While it was possible to get near enough to the correct weight for all practical purposes, mathematical precision was impossible. Everything, therefore, was not plain sailing for the buyer. There was quite an erroneous opinion amongst many farmers as to the money made by wheat buyers, but the experience of the South Australian Farmers' Union rendered it unnecessary to quote figures to show that fortunes were not easily made out of the business. With fair competition amongst merchants, and the farmer's own intelligence to help him, he thought there was nothing to fear in respect to unfair treatment.

Gladstone, May 7.

Present—Messrs. Sargent (chair), Burton, Smith, Cook, Brayley, Goode Greig, McDonald, and Wornum (Hon. Sec.).

Membership.—Members unanimously agreed with suggested alterations of rules. Discussion on method of determining who should retire first brought forth the suggestion that the five senior members should initiate the change.

Formalin for Pickling.—Mr. D. Smith read article from April issue of *The Journal of Agriculture*, and a good discussion on pickling wheat followed. In reply to question, Mr. Goode thought instances of only one side of a head of wheat being bunted was due to the spores having attacked and grown in the filaments on one side only. Most of the members strongly advocated pickling seed wheat, though the injury to the seed was referred to. It was decided to obtain some formalin, five of the members undertaking to carry out experiments.

Willunga, April 9.

Present—Messrs. Pengilly (chair), Valentine, J. and W. Binney, Manning, and Hughes (Hon. Sec.).

Manuring.—Mr. Malpas forwarded a paper on the principles which underlie manuring. If a healthy wheat plant be taken, roots and all complete, carefully washed, so as to remove all traces of soil, then placed in a crucible, and subjected to a strong heat, it will shortly be reduced to ash, and this ash contains the following elements:—Oxygen, potassium, carbon, sodium, sulphur, calcium, phosphorus, magnesium, silicon, iron, chlorine, manganese. If they added hydrogen and nitrogen to these as being among the gases which were driven off by the heat, they had all the elementary substances which belong to agricultural vegetation. It was not his purpose to present an exhaustive treatise on the growth of plants; but he would confine himself to the consideration of the three elements which affect economic agriculture, and would endeavour to demonstrate the relation in which they stand to our agricultural lands, and to point out briefly how the seed which is placed in the soil germinates and grows, using these elements to build its structure and produce its seed again. These three elements, placed in the order of economic importance in which they stand to the South Australian farmer, are phosphorus, nitrogen, and potassium. First take phosphorus, which is always estimated in agricultural analysis as phosphoric acid (P_2O_5) The points to consider in connection with it are its effects on the growth of cereals, and the quantities of it which average crops remove from the soil. It plays an important part in the development of the young plant. It has long been known that young plants which have been enabled to reach a supply of soluble phosphoric acid immediately after germination have started on their career with much more vigour than those which have to search for and in the end get but a scanty supply of this most necessary plant food. This is because it enters largely into the formation of the nucleus of each cell; so that when a young plant, possessing but a small root system, can readily take up phosphoric acid, it stands to reason that the start will be vigorous. It also influences the yield of grain to a very large extent. Liberal dressings of phosphates will stimulate the crop to produce larger and heavier grain, though the yield of straw may not be increased to any great extent. The following comparison of figures will serve to illustrate this. One thousand average oat plants were taken, and their period of growth divided into four. The plants and the ears were analysed separately, showing these results:—

	Grammes of P_2O_5.			
	1st.	2nd	3rd.	4th.
Straw	3.62	4.95	2.22	1.70
Ear	2.36	5.36	10.67	12.52

It would be seen that, as the plant matures, the grain not only appropriates all the phosphoric acid which the roots take up, but robs the straw of a large portion of that which was previously fixed in its tissues. Although the proportions in which the ash ingredients exist in crops vary so much with the varying conditions under which crops are grown, that it is impossible, without carefully analysing each sample, to say how much a given crop has taken out of the soil per acre, yet numerous analyses have established averages which are sufficient to go upon when the question of how much manure should be applied per acre comes up. The following are some of Professor E. von Wolff's averages:—

Comp.: 1,000 parts.

	Nitrogen.	Potash.	Phosph. Acid.
Grain –			
Oats	17.6	4.8	6.8
Wheat	20.5	5.6	9.0
Barley	16.0	2.8	5.6
Peas	35.8	10.1	8.4
Straw—			
Oats	5.6	16.3	2.8
Wheat	5.6	11.0	2.0
Barley	6.4	10.7	3.8
Peas	10.4	9.9	3.5

Taking a 20-bushel crop yield as a standard (1,200 lb. to 1 240 lb. of wheat per acre), it will remove about 11 lb. of phosphoric acid. This is not very much, but when the quantity supplied in a dressing of superphosphate is considered,

the significance of the figures will be more apparent. Nitrogen is the next element to consider. The action of this on the plant goes largely towards building up rank vegetative tissues. Particularly does this apply to the growth of leaves. Where a crop has been plentifully supplied with nitrates it appears to be not only nourished, but stimulated. It produces a heavy crop of leaf or flag, and the root system searches out as much of the available nutrition in the soil as it can find use for. On this account nitrates have at times been called exhausting; but the term can hardly be considered correct Analysis of such a crop will show that no higher percentage of ash has been taken out of the soil than would be the case of a crop not treated with nitrates. Only if two tons be grown on the land instead of one ton, it is to be expected that it has taken up a corresponding quantity of ash ingredients. This stimulating action is attributed more to nitrates than to organic manures; but t any time a soil rich in nitrogen, whether it be chemical or organic, if other conditions are favourable, will carry a luxuriant crop, but the yield of grain will be very probably small. The table previously given shows that a 20-bushel crop has taken about 24 lb. of nitrogen per acre. Potash is the nutritive element which, so far, has caused the South Australian farmer the least anxiety. Its application to crops results in a healthy formation of stems and seeds; though it does not lodge in the seeds to such an extent as in the straw, as will be shown by the table. All leguminous plants take up a large amount of potash, so that where 1,000 lb. of wheat take only about 5 lb. from the soil, the same weight of peas will take from 12 to 13 lb. Plants grown with a plentiful supply of nitrogen, but a scanty supply of potash, show little inclination to ripen, but remain stunted and green. Then they came to the condition of these elements in the soil, their sources as plant food, and the methods employed in augmenting any or all of them, should the soil appear to be deficient. In the first place it is necessary to arrive at a correct idea of what soil really is. Simply, it may be viewed as made up of three parts. First, a great bulk of inert substance which will not contribute at all to the nourishment of a plant. This is composed of sand, clay, stones, etc. It may have a physical effect, but it contains no nutritive elements. Secondly, the small quantity of available plant food. Thirdly, a mass, which comes second in size, of material which, under the influence of various chemical agents in the soil, is constantly breaking down and yielding plant food. It may come into use quickly or slowly, according to existing conditions but were it all available to the depth of a foot it would present a soil which would grow enormous crops for generations to come. But such is not the case, and long experience has shown that after the freshness of virgin soil has been taken away they must resort to artificial means in order to secure at least a fair crop. There are several methods of increasing the available plant food The first is by treating the soil in such a manner that the insoluble elements will become soluble. Frequent working of the soil, by exposing it to the air and sunlight, will bring this about, and preserving a good tilth maintains the soil in a moister, cooler condition, thus enabling the various ferments to act on insoluble matter, and to render it soluble Addition of amendments, such as lime, gypsum, or salt, and, lastly, by adding soluble plant food Phosphoric acid exists in the soil in the form of phosphates of calcium, iron, and aluminium All three are insoluble. They are brought slowly into use by the weak acids in the soil, and by the acids generated by the roots of plants. The phosphates of iron and aluminium are more insoluble than phosphate of lime, but commercial chemistry deals with four phosphates of lime —

Monocalcic, $CaH_4(PO_4)_2$.	Soluble in water.
Bicalcic, $Ca_2H_2(PO_4)_2$.	. Soluble in weak acids.
Tricalcic, $Ca_3(PO_4)_2$.	. Soluble in strong acids.
Tetracalcic, $Ca_3(PO_4)_2CaO$	. Soluble in weak acids.

Tricalcic phosphate is contained in bones and phosphatic rocks: but when these are treated with strong sulphuric acid it is converted into monocalcic phosphate. Superphosphate is the result of this process, and is a mixture of monocalcic phosphate and gypsum (calcium sulphate). If kept for long, it begins to revert first to bicalcic, and finally to tricalcic phosphate. Now, when super is applied to a soil, the first rain dissolves it, and it permeates the surface layers more thoroughly than that could be brought about by any mechanical means. But the lime in the soil soon reverts it to the insoluble tricalcic phosphate. However, this is so evenly distributed just around the seed that the roots quickly take advantage of it: but no amount of rain will remove it from the soil when once it is fixed. Tetracalcic phosphate is contained in basic slag, but the solubility of this manure is too variable to speak of it with much certainty. The knowledge of this fixation of phosphates in the soil reassures them as to the advisability of heavy dressings of manure. Except on wet and acid soils, it is not carried down into the subsoil. It remains fixed in the top layers of the soil, and if the crop does not get it one year, it will get it the next. Now, when they apply 100 lb. of 36 per cent. super to the soil, they add 16.5 per cent. of phosphoric acid to the soil, of which a 20-bushel crop will remove 11 to 12 lb. in the grain alone, and the straw will remove another 4 to 5 lb So a dressing of 100 lb. leaves the soil no richer, if not a little poorer, than it was before. When manures of a lower value are added at the rate of 1 cwt. or less per acre, and a fair crop is obtained, it is obvious that it is only a matter of time for the soil to become so impoverished that it will no longer answer to light dressings. It seems probable that the reason why fallow land often responds to a light dressing of phosphate is because the manure round the seed at the time of germination gives rise to healthy, vigorous young plants, which develop a strong root system, and are consequently enabled to hold their own; but the fact remains that this cropping will in time reduce the fertility of the soil. The tricalcic phosphate in bonedust is dependent on natural agencies to render it available as plant food. Although it is the cheapest form of phosphate on the market, this insolubility places it at a disadvantage. It is possible to get nearly all the value of a dressing of super in the first year, and the remainder in the two following; but a dressing of bonedust will show its effect for as long a period as ten years. It remains, then, to be considered whether it is not better to lay out an amount which will give a quick return, rather than a somewhat less amount, which will take three times as long to come back. Nitrogen is found in the soil, either in the form of nitrates, or ammonium salts, or in organic compounds formed by decaying animal or vegetable matters. Although agricultural plants will absorb ammonium salts, and there appears to be reason for supposing that ammonia is necessary for the building up of certain parts of a plant; yet, on the whole, nitrates seem to be the more important form of nitrogen, and the one which can be applied with greater safety to a crop. In fact, where conditions are favourable, ammonium salts are converted into nitrates by the ferments existing in the soil. Should a farmer wish to add nitrogen to the soil in a chemical form he must use either nitrates or ammonium salts. They had seen that 20 bushels of wheat per acre removed 25 lb. of nitrogen, while 1 cwt. of nitrate of soda contained 16.5 lb nitrogen, and 1 cwt. sulphate of ammonia 28 lb. nitrogen. At first sight, these figures make the question of nitrogen in their soils appear somewhat serious, and seem to present a prospect of their expenses for manure being considerably raised in years to come. But there are other sides of the nitrogen question which introduce much less expensive methods, and, it might almost be said, methods which, while they renew the nitrogen in the soil, at the same time pay the farmer for using them. The third form of nitrogen mentioned was organic nitrogen, and this is a very important form. All decaying vegetable and animal matter in the soil goes to form that dark mould which is known by the name of humus. This contains nitrogen, though not in a form available for plant food. But where the soil is in a moist condition, and more especially if it be loose, the ferments in the soil are, rapidly or slowly, according as the temperature is high or low, converting the nitrogen of the humus into nitrates. Nitrates and ammonium salts are readily soluble. Nitrates especially are quickly leached out of the surface soil, and carried by rain water into the subsoil. Ammonium salts are retained to a certain extent by soils rich in humus. Not only does humus contain and retain nitrogen for the use of crops, but it has a physical effect upon the soil which must not be overlooked, and may as well be mentioned here as put by itself later on. It retains moisture in the surface layers of the soil, and it improves the tilth of the land. This is likely to be a serious question in years to come if chemical manures are used as unintermittently as they are now. Heavy cropping will remove the humus from the soil, and its physical conditions will be altered very much for the worse. Dressings of farmyard manure stand first as a means of restoring humus to the soil; but next to that, and, so far as practicability on a large scale goes, before that, comes the practice of green manuring. The plants used for green manuring, as a rule, are those which produce an abundance of succulent vegetation in a short space of time. Their roots quickly search out nutritive elements from the soil, often going to a considerable depth. When the crop is ploughed in, it is all deposited at the depth of five or six inches below the surface. That means that enough nutrition is brought to the surface of the soil to support a fair crop. Nitrates and ammonium salts, which might have been leached out of the soil, have been arrested, and stored in the form of organic nitrogen. The fermentation which the decay of this vegetable matter sets up gives rise to large quantities of carbon dioxide, which has the effect of bringing inert phosphates and potassium salts into solution, and, above all, the soil is enriched by a large quantity of humus, which not only contains nutritive elements, but has such an important physical effect on the soil. Such manures as blood manure, guano, and some bonedusts contain organic nitrogen. There is this advantage with them: they do not leach out of the soil with the first rain, but come into use more or less slowly. Leguminous plants, as is well known, possess the power to fix nitrogen from the atmosphere in the soil. Or, rather, this is brought about by certain ferments which that class of plants harbour on their roots. This makes the growing of leguminous crops, where conditions are favourable, a practice of considerable importance. Not only do they yield a return themselves, but they leave the land richer in nitrogen than it was before they were grown there. There remains but little to say on the subject of potassic manures. As a rule, potash is the last of the three substances under consideration to run out in the soil. It is taken up in smaller quantities by crops, and is generally present in the soil far in excess of their needs. It exists in the form of insoluble double silicates, which are rendered available by the action of carbon-dioxide in the rain water. Dressings of gypsum will increase the available potash in a soil. But to increase the actual amount, sulphate and muriate of potash and kainit must be resorted to. Having now considered, though briefly, the relation in which nutritive elements stand to both crops, and the soils in which crops grow, it only remains to indicate as simply as possible by what methods a plant builds up its structure and finally yields its perfect fruit. First comes germination. When a seed is placed in contact with moisture it at once begins to absorb water, and to swell in consequence. The absorbed water quickens the germ of the seed, and at the same time begins to dissolve the nutritive elements stored up there for the first use of the young plant. The first organ to appear is the radicle, which pushes its way down into the soil; and the next is the plumule, which pushes upwards, and develops the leaves of the plant. By the time the plant has used up all the food in the seed it has established relations with the surrounding soil, and is quite ready to carry on an independent existence. But its future, whether it is to be a success or a failure, depends largely on whether at that time it is able to make a vigorous start. The same principle applies to plants as to animals. Stunt a young animal, and every one knows no amount of subsequent care will ever quite retrieve the loss. Conversely, give a young animal a good start, and, later on, should misfortune come, it seems to have a reserve force which will carry it through a good deal. So with a crop, a bad start is about the worst thing that can happen to it, while a good start means half the battle. They must now follow up the absorption of the ash ingredients. It will not be necessary to make an exhaustive study of the organs of a plant in order to understand the function of nutrition. It will be sufficient to examine what may be termed a simple cell to obtain all the illustration necessary. A simple cell consists of walls of a membrane of cellulose, and within the walls may be found free water, a jelly-like substance called protoplasm, and in this a tiny spot called the nucleus. It was to the cell wall and to the nucleus that he would direct attention. Here it will be necessary to explain a simple physical law, in order that they may understand the relation which exists between this free water and the membranous walls of the cell. If an ox bladder be filled with water, it will in some respects resemble a vegetable cell on a large scale—that is, it will be a membrane containing water. Plunge this into a bucket of brine for some time, and a curious thing will happen. Some of the brine will force its way through the membrane, and this will go on until both the outside brine and the contained water have reached the same degree of saltness. More than this, if the contained water were a solution of sugar, the sugar would pass out, and the salt would pass in, until the two solutions were perfectly mixed. This is called the law of osmose. All salts which crystallise obey this law, and they are termed crystalloids. But there is a class of substances which, though they may dissolve readily in water, do not obey it, and they are termed colloids. For example, if the bladder contained a solution of a colloidal substance like gelatine the salt would readily force its way into the bladder, but the gelatine would not pass out. Now, they could readily understand what happens when a plant buries its roots in the soil. First, imagine the soil as a sponge soaked with solutions of ash ingredients. The ends of the root hairs are cells. The salts in the soil at once diffuse through the tissue into the cells. But these adjoin other cells, and the salt passes on, making room for more to follow, and so on, until it reaches the uttermost parts of the plant. But in building up its structure the plant fixes some of these salts, taking them out of solution, which means that the solution in the cell is weaker than that in the soil, and so a fresh movement sets in. But some of the ash ingredients are insoluble in the soil water. If the bladder, which is used for illustration, were filled with a weak mixture of hydrochloric acid and water, and placed on a layer of limestone in the bucket of water, it would soon be found that the bladder contained calcium chloride, which would show that some of the acid had passed through the membrane, and dissolved the lime, and the resulting salt had in turn passed back into the bladder. This is exactly what happens between the root cells and the insoluble ash ingredients in the soil The roots develop weak acids, which digest insoluble matters as they come across them. So these functions are carried on during the whole growing season of the plant, which season extends actually from the time of germination until perfect maturity has been arrived at; though practically it is from germination until the blooming of the plant. Careful observation has led to the following conclusions:—"The weight of the live crop is greatest at or just before the time of blossoming. After that period the total weight diminishes. The organic tissue (dry matter) continually increases in quantity up to the maturity of the plant. The loss after the time of blossoming falls entirely upon the water of vegetation. At the time of blossom the plant has its greatest absolute quantity of water of vegetation, while its least quantity of this ingredient is found when it is fully ripe." The greatest quantity of ash ingredients is taken up during the period which lies between germination and full bloom. Although the part of the crop which appears above ground will considerably increase in ash ingredients just before it becomes fully ripe, it draws these from reserve stores in the roots, and not at the expense of the soil. So that what may be termed the growing period is that during which the crop has a direct relation to the nutritive elements which are placed at its disposal in the soil. This growing period is long or short, according to climatic conditions. So long as the soil contains sufficient moisture to hold the ash ingredients in solution, crops will grow on it; and the vigour of the crop will be in direct proportion to the warmth of the climate. Consequently the longer and more vigorous the growing period the greater the quantity of manure which may be used; and at the same time the less need there is for the use of immediately soluble manures. Because, under such conditions, namely, heat and moisture, a hundred and one agencies are brought into play to render insoluble manures soluble. If, on the other hand, the growing season is short, readily soluble manures must be used. For one thing, presumably the rainfall is not heavy enough to easily leach them into the subsoil, and at the same time it is necessary to force the young crop along, so that it may store up reserve materials against any unfavourable period which may befall during its growing season.

Woodside, May 2.

PRESENT—Messrs. Caldwell (chair) Hutchens, Drogemuller, Lauterbach, James, Pfeiffer, Rolbusch, Fowler, Keddie, and Hughes (Hon. Sec.).

MEMBERSHIP.—Members endorsed alterations in membership rules suggested by Wilmington Branch.

THE QUALIFICATIONS OF A FARMER.—Mr. G. F. Lauterbach read a paper on this subject. Many people seemed inclined to look down upon the farmer, but, in his opinion, the farmer's calling was one of the most honourable, useful, and difficult. A man may become highly efficient by the time he reaches the age of twenty-five in a number of callings usually considered of higher rank than the farmer; while it takes a whole lifetime to become a thoroughly practical and skilled cultivator of the soil. Just consider the many and varied phases of farm work. The farmer must be a good judge of land, and have the ability to determine how to work the various classes of soil on his property With judicious tillage and discrimination in the use of fertilisers and the selection of crops, even poor land may be made to produce profitable returns. but, at the same time, injudicious treatment of the same land may easily prove ruinous to the proprietors. He regretted that ploughing matches had gone out of fashion, as, in his opinion, good ploughing was not only satisfactory to look at, but was also a factor in successful cultivation. If the land is properly turned it is better for working the harvesting machines: bad ploughing, be affected by the disease. I saw an interesting illustration of this early in October last at Yongala. Mr. J. Williams, a farmer, reported his cattle dying suddenly. On reaching the farm I found to my surprise that the milkers were looking well, and that it was the young, dry cattle that were suffering, two having died and another dying of paralysis. On questioning Mr. Williams I found that he was giving the milkers a feed of boiled wheat every day. I advised giving the dry cattle wheat, which was done, and we have had no further trouble. I could give many instances of this kind. All the evidence appears to point to the want in the soil of important soil constituents that are necessary for the proper nutrition of animals feeding on it; in other words, soil exhaustion. *Post-mortem* appearances.—There is an absence of changes which would enable the cause of death to be readily stated, and any of the changes that do occur can be accounted for by the disturbance of the digestive functions. The stomachs are usually loaded, sometimes the omasum is impacted and dry, the intestines generally empty or containing fluid only; the bladder is generally empty and the gall bladder very full and the brain and spine are more or less congested. All the remedies and preventives are, after all, only palliative. Farmers should not forget that they have been taking the nutriment out of the soil for years without giving any return, and that the whole trouble lies in the poverty or exhaustion of the soil.

Arden Vale, May 2.

Present.—Messrs. Warren (chair), Pearce, Fricker, Schuttloffel, Miller, Francis, Klingberg, W. and J. Williss, and Hannemann (Hon. Sec.), and two visitors.

Membership.—Alterations suggested by Wilmington Branch in membership rules were discussed and agreed to, with the exception that members did not like the idea of candidates proposing themselves for election.

Home Garden.—Mr. Pearce read a paper on plea for the garden, and how to make the home attractive. He referred to the many failures in the North during the past ten years with gardens, but stated that he had been successful in spite of all drawbacks in securing, during the past two seasons, an abundance of fruits, mainly peaches, nectarines apricots, quinces, almonds, plums, and grapes, which he would recommend for cultivation in the North. Where possible, the garden should be laid out where surface drainage waters can be diverted on to the land As much water as possible from the hillsides and roads should be secured, and the ground given at least one thorough soaking during the winter. He also found it all-important to keep out birds and vermin. A vermin-proof fence would keep out the latter, but the birds were more difficult to scare. He did not find it difficult to frighten the sparrows and other small birds; crows could be caught in traps; but the parrots were very troublesome to deal with. He had found shooting the only method of any value, and it was necessary to encourage the women to use a light, handy shotgun, as they were about the house all the time, whereas the men folk were away so much. He had taught his wife to shoot, and now he found that on an average it did not take more than five or ten minutes of her time each day to keep the parrots away. For ornamental trees he recommended sugar gums and pepper trees for this district. Members generally agreed with Mr Pearce, and thought more attention should be given to the conservation of water for irrigating small areas in the northern districts. The idea of teaching the women folk to shoot, as a means of preventing losses of fruit, was also supported,

Stockport, April 25.

Present.—Messrs. Godfree (chair), Stribling, Thomas Perry, Howard, Watts, Hogan, and Murray (Hon. Sec.).

Pickling Seed Wheat. Discussion on quantity of bluestone to use took place. Most members use 8 ozs. to the bag of wheat. One used 1 lb. of bluestone dissolved in four gallons of water for three bags of wheat. Two members are trying formalin this year.

Mount Pleasant, April 13.

Present—Messrs. Phillis (chair). Thomson, Miller, Drogemuller, Maxwell, Tapscott, and Giles.

Membership.—Suggested alterations in membership rules were discussed at length, and it was unanimously resolved that this Branch is unable to recommend the adoption of the rule that one-third of the members should retire annually, to afford an opportunity to get new blood into the Branch. The experience of this Branch during fifteen years is that most of the young members who have joined at different times soon drop out, and difficulty is experienced in keeping up the roll.

Stansbury, May 7.

Present—Messrs. Sheriff (chair) Anderson, Faulkner, Jones, Pitt, and Cornish (Hon. Sec.) and one visitor.

Membership.—It was unanimously resolved that this Branch support alterations in membership rules as suggested by Wilmington Branch.

Pruning.—Arrangements were made for pruning demonstration by Mr. Geo. Quinn, and show of cultivating and other garden implements, on July 6.

Port Elliot, May 21.

Present Messrs McLeod (chair), Pannel, Nosworthy, Green, and Hargreaves (Hon. Sec.).

Vegetation Diseases Bill This was discussed at some length, and a number of the clauses failed to meet with the approval of members.

Gawler River, April 29.

Present - Messrs. Parker (chair), Leak, Winckel, Baldwin, Kreig, F. and H. Roediger, Dawkins, Day, and Bray (Hon. Sec.), and three visitors.

Grading Seed Wheat -Mr. H. Roediger reported on trial of grading machines held at Roseworthy College. The Mayer grader did very satisfactory work, and turned out a magnificent sample of seed wheat.

Seeding.– Mr. Roediger initiated a discussion on seeding operations. He took it for granted that the fallow was clean and in good condition. He would sow only sound, plump grain, and adhere to well-tested varieties of wheat; rust-resistant sorts should constitute the bulk of the crop. Early, rust-escaping varieties should be used to a limited extent. New kinds should be tested on a small scale before being largely grown. In pickling seed, bluestone and formalin were most useful The hot water treatment was not largely adopted owing to the bother, while patent pickles were, as a rule, avoided. Four ounces of bluestone in 1¼ gallons of water was sufficient for one bag of wheat. Formalin was used at the rate of 1 lb. to 40 gallons and had one great advantage over bluestone, in that it did not affect the germination of the seed. So far mineral super has, on the whole, in proportion to the cost, given best results of any manure tried. It was advisable to harrow after the drill, as the land is left more even, and facilitates harvesting operations. A good discussion followed. All members agreed that good plump seed gives the best results, and, with one exception, that pickling with bluestone was a preventive of smut. Various methods of applying manure to the land are practised. Some drill the manure in early and broadcast the seed later on. While good results are usually obtained, it is found that with early rains there is a vigorous growth of weeds by seeding time. The general practice, however, is to sow seed and manure together. Mr. F. Roediger stated that where the land was infested with poppies he found it a good plan not to harrow at once after seeding, but to wait until June, and then to harrow across the drilling. Large numbers of poppies would be destroyed, while on heavy land the wheat would benefit materially by the harrowing.

Whyte-Yarcowie, May 21.

Present—Messrs. Hack (chair), Hatherly, Pascoe, Makin, Faul, Dowd, Mudge, Kornetski, Francis, Jenkins, McLeod, Pearce, Hunt and Boerke (Hon Sec).

Membership —Members approved of suggested alterations in membership rules, with the exception that they thought it not advisable to allow candidates to nominate themselves This should be done in each case by a member of the Branch

Paspalum Dilatatum —Mr. Pascoe, referring to editorial footnote to paper on this subject pointed out that he did not suggest the cultivation of this plant indiscriminately in the North, but that farmers should try it on a small scale on low-lying land or along watercourses, where the ground was of considerable depth, and could be flooded "Success" was a relative expression They could not expect to get the growth they would secure in the wet districts, but the same applied to wheat What constitutes a successful crop in the dry areas would be regarded as a partial failure in the South-East The paspalum was highly spoken of in New South Wales as a drought-resisting fodder and, as its nutritive properties were very high, it was worth trying It has been grown successfully from seed in South Australia, both on ploughed land and on pasture, without any preparation Two members intend trying it this year in this district

Naracoorte, May 14.

Present Messrs Forster (chair) Cotton Attiwill, Caldwell, McLay, Duffield, Coe, and Schinckel (Hon Sec)

South-Eastern Conference - Delegates reported on proceedings of Conference at Bordertown, and a vote of thanks was accorded to Tatiara Branch for its hospitality

Blow Fly —The Hon Secretary referred to injury caused to sheep this year by the blow fly, the season having apparently been very favourable to the fly Sheep dip, kerosine, and turpentine had all been used successfully as preventive, but the Chairman considered that the best remedy was personal attention at this season of the year, especially to breeding ewes

Lucindale, April 30.

Present—Messrs Feuerheerdt (chair), McInnes, Tavender, Limbert, Carmichael, Williams, Matheson, and Beatton (Hon Sec) and two visitors

Brands Act and Sheep Stealing —Paper by Mr T Redman, of Kingston Branch, was discussed and the members approved of suggestion that the Brands Act should be amended to provide for the proper waybilling of travelling stock

Western Australia —Mr S Tavender read an interesting account of a visit to Western Australia His family having outgrown his present holding, he visited the neighbouring State with a view to taking up some of the land suitable for mixed farming, grazing, and gardening which the Western Australian Lands Department so widely advertised Going from Perth, through the farming districts of York Beverley, Wagin, etc to Katanning, in three stages, he had an opportunity of examining the soil etc , and was much disappointed with it as a whole For miles the railway line is unfenced, and stock of all kinds are generally conspicuous by their absence Apparently as yet only the gullies and land along the creeks are much sought after for farming though most of the land is heavily timbered—an indication of good soil At Wagin many South Australian farmers have settled, and the soil there is a little better than near the railway line In many places further back there were sandy slopes similar to some of the slopes from local sandhills to the swamps, but without the fern, and if he wanted land for wheatgrowing he would prefer the Wagin land to any other he saw in Western Australia. At Katanning the soil is sandy and somewhat similar There were some large vineyards and orchards here, but, possibly owing to his twenty-five years in the Angaston district, he was not particularly impressed with them Coming back from Katanning to Narrogin the soil is sandy and an ironstone gravel mixture, varying from almost pure gravel on the hilltops to gravelly loam in the gullies, and all growing much timber. From Narrogin he drove along the proposed rail route to Collie, and through the 800,000 acres now being advertised. In this locality, on the way to Williams, the soil is not so gravelly and has been settled for many years. It is still mostly heavily timbered. In the advertised country, for five or six miles, the soil is rather gravelly, and covered with a fine, silver grass, as dry as stubble. Then he passed into sand plain country, which, if it were not for the poison bush, would feed a few sheep to the acre. Leaving here he inspected some selected land on the Arthur River somewhat above the average quality. Although settled for nearly twenty years, produce has to be carted forty to fifty miles to the railway. Sheep were seen in some stubble paddocks; but, in order to prevent the sheep getting on to the poison bush, the paddocks are enclosed with pig-netting with barb-wire above. From here commences the jarrah country, consisting very largely of ironstone and sand mixture, rocky in places, with gullies of good black, sandy loam, all heavily timbered. The part known as the Collie Flats is mostly low-lying, wet in winter, and covered generally with a kind of ti-tree. The soil is heavier and free from gravel, with good sandy loam, suitable for onions and potatoes, in parts. The area, however, is very limited, and the best has already been selected. The remaining nine miles to Collie is all jarrah forest, and, in his opinion, likely to remain unselected, except in small patches. From Collie, across the range to Brunswick Junction, is jarrah forest and very steep hills, with soil of a little better quality. This is described in the official pamphlets as similar to much of the Gippsland country, but he failed to find any land to compare with Gippsland. From here he went along the Bunbury line to Perth, and, although patchy, the land was the best average country he inspected. Some of the land is very wet in winter, and is being drained. It is heavier in places, and similar to the land around Dry Creek. There were some fairly good gardens, and some good orange groves and vineyards in this locality. At Harvey oranges promise very well indeed. At Armadale the vines were good, but, to his mind, the fruit was not so rich or sugary as that grown in South Australia. In other parts there were good gullies for vegetables gardens, etc., but, with the block of 800,000 acres open to selection, which he particularly went to see, he was much disappointed. He read Mr. Grasby's very sanguine reports in the Western Australian papers, but the impressions he formed were very different; from the point of view of mixed farming the country was very poor. What he was particularly struck with was the startling predominance of the ironstone gravel and sand country. His impressions were not the result of a journey by means of the railway through the country, but of careful inspection as a would-be settler, and his travels extended over 500 miles, without counting wayside trips, and part of the time he was camping out. While admitting that they could probably grow more wheat and hay than they needed he did not think West Australia would be a serious competitor for many years in the export of fruit. In the dairying industry he did not see much prospect of supplying even local demands for a long time, nor was he impressed with the results likely to be obtained from the keeping of sheep on the land inspected.

Crystal Brook, April 30

Present—Messrs. Pavy (chair), Miell, G. and G. M. Davidson, W. and A Hamlyn, Townsend, Venning, Dabinett, Morrish, Hutchison, and Symons (Hon. Sec.).

Membership.—While the general attendance throughout the year has been satisfactory, two or three members were very lax, and it was decided that they be informed that their names would be struck off the roll unless they attended more regularly.

Co-operation.—Mr. R. Pavy read a paper on this subject. He could not understand the reluctance of farmers to co-operate, as the benefits to be derived from the sale of produce on their own account and the purchase of manures, implements, etc., through an Association, were so great. There was no question that the difference between the cost of farm implements in America and the price at which they were sold by the local firms was far too much, and if the farmers would buy through the Farmers' Union they would soon be able to effect a considerable reduction in cost. They could also sell their products to better advantage All the merchants and their many agents were making a living out of the farmers, and he could not see why they could not make the Farmers' Union the medium for the disposal of all their produce Take the live stock market as an instance of the unnecessary expense for agents, etc. In the Adelaide market they had a number of agents, each selling stock for a short fixed time in rotation, whereas by co-operation one man could do all the selling This would mean a considerable saving to the producer The paper was well discussed and met with general approval

Colton, May 14.

Present Messrs P P Kenny (chair) Whitehard Barnes, Kleeman, Andrew, Hull, and Packer (Hon Sec)

Fertility of Eggs--Members were unable to say how long after the rooster is removed from the pens the fowls would continue to lay fertile eggs [It is not advisable to set eggs laid after the fourth day, though a percentage may prove fertil several days later --Ed]

Cows Chewing Bones - A member wished to know cause of cows eating bones and other rubbish and whether there was any preventive [Read paper by Stock Inspector Needham, in report of Mundoora Branch in this issue of *Journal of Agriculture* --Ed] Mr Barnes tabled a sample of ensilage and stated that he had been feeding sixteen cows on ensilage for over three months with satisfactory results, not only as regards milk yield but also their freedom from trouble caused by impaction

Poultry Competition --Members criticised results of recent egg-laying competition at Magill, and did not consider the results at all satisfactory They would like to know if there was any special reason for the great differences between the Hawkesbury and Magill results

Caltowie, April 26.

Present-- Messrs Hewett (chair), Petatz, McCallum, Neate Potter, Royal McDonald, Jettner, Moore, J G and F Lehmann (Hon Sec) and five visitors

Membership Members did not approve of suggestion of Wilmington Branch that one-third of the members should retire annually but favoured election of members by ballot

Stinkwort Killing Sheep --Discussion took place on alleged injurious effects of stinkwort and it was generally agreed that it was very dangerous to ewes about to lamb though dry sheep which were used to it did not seem to suffer

Virginia, April 25.

Present--Messrs Hatcher (chair) Nash White, Taylor, Huxtable, Pavy, Strempel, Thompson Odgers Sheedy Baker Johns and Ryan (Hon Sec)

Membership --Suggestions submitted by Wilmington Branch for alteration in membership rules were unanimously approved

Lucerne --Mr Pavy initiated a discussion on this subject He would in clean land sow seed with barley early in the season, so that the lucerne got a good root before the dry weather set in Where sorrel was plentiful he would wo[illegible] land well during the winter, and sow seed about August, as then th[illegible] would become established before the sorrel grew again the follo[illegible]son Most of the members thought that once the lucerne was est[illegible] it would choke out the sorrel.

[illegible]kling Wheat --Discussion on this subject took place Most of the m[illegible]ers are using formalin this year

Angaston, April 30.

Present—Messrs. Snell (chair), Smith, Player, Rundle, Vaughan, Sibley, Radford, Salter, Friend, Thorne, Trimmer, and Matthews (Hon. Sec.), and two visitors.

Homestead Meeting.—This meeting was held at the residence of Mr. Jas. Rundle, Manager of Tarrawatta Station, and a very interesting and instructive tour of the station was made under the supervision of Mr. Rundle. The imported hackney stallion Sir George was much admired; other stock also came in for considerable attention. The up-to-date woolsheds, sheep-dip, wool-presses, patent sheep gate, colt-breaking yards, etc., were carefully inspected, and Mr. Rundle explained the working of the various contrivances. Mr. Rundle's flock of Silver Wyandotte fowls were greatly admired, and their value for egg production and table poultry strongly commended by the owner. After the inspection the visitors were entertained by Mr. and Mrs. Rundle, who were accorded a hearty vote of thanks for their kindness.

Membership.—The suggestion of Wilmington Branch, that the membership rules should be altered to provide for the retirement of one-third of the members annually, met with approval.

Poultry Farming.—Mr. J. Rundle read a paper on this subject. He was a strong advocate for pure-bred fowls, and after many years' experience preferred the Silver Wyandotte as an all-round utility fowl. He found the Buff or Brown Leghorn, crossed with the Buff Orpington, hardy, active birds, and good layers. Success in poultry farming depended as much on "the man behind the fowls" as on the particular strain of fowls kept. The poultry-keeper must possess an aptitude for his or her work; and healthy surroundings, strict attention to details, method in feeding, and a willingness to sacrifice a lot of spare time on the fowls was required. Entire freedom from vermin, scrupulous cleanliness and well-ventilated houses, free from draught, were essential. He considered ruberoid one of the best materials for poultry houses. In starting business, the poultry-keeper should procure the very best stock within his means. He advised giving warm food in the morning, green food mid-day, and grain at night; shell grit and clean water daily were necessities. No rooster should be allowed with the ordinary laying hens. He considered July to September the best months for raising chicks. Eggs are fertile within a week of the rooster being penned up with the breeding stock. For scaly legs a good cure was to wash well with warm, soapy water, and then rub in a mixture of lard, sulphur, and a few drops of carbolic acid. Douglas' mixture was a good tonic used judiciously, especially for birds that were moulting. Meat and scraps were valuable aids to egg production.

Morphett Vale, May 17.

Present—Messrs. Perry (chair) Hutchison, Depledge, McLeod, and Anderson (Hon. Sec.).

Black Rust.—Mr. Depledge showed sample of crop resulting from unpickled seed sown on dry land on March 20 of last year. The crop was very badly attacked by black rust, and he intended this year trying experiments with formalin and other pickles. Some discussion on pickling seed wheat ensued.

Penola, May 13.

Present—Messrs. Darwent (chair), Worthington, Kilsby, Peake, Stoney, McBain, Miller, McKay, Ricketts, Alexander, and Allnutt (Hon. Sec.).

Feeding Dairy Cattle.—Mr. McBain's paper on this subject, published in March issue, was re-read, and discussed at length. The majority of the members agreed with the treatment suggested in the paper. Members were of opinion that unless the cows were properly looked after, and the rugs removed on all fine days, the practice of rugging would prove injurious. The general idea was that shelter sheds, which could be erected at small cost, would be better than rugs, and, being permanent, would be cheaper in the long run.

Onetree Hill, April 28.

Present—Messrs. J. Bowman (chair), G. and F. Bowman, Blake, Cowan, Flower, Hogarth, Ifould, W. and A. E. Kelly, Smith, Thomas, and Clucas (Hon. Sec.).

Membership.—Suggested alterations in membership rules were discussed, but no definite resolution was carried. While the members thought the adoption of the proposed rules would probably be beneficial in some cases, it would also prove inimical in others. There was nothing to prevent the adoption of these rules by those Branches whose members are of opinion that the result would be beneficial.

New Beehive.—Mr. F. Bowman described what he termed his "Simplicity Beehive for Langstroth Frames." The hive was made of ¾-inch American shelving, was 28 in. x 20¼ in., and 10 in. in height. It holds 18 frames across the box. The lid is made in two parts, the front portion being 12 in. x 20¼ in., and the back 16 in. x 20¼ in. He found this hive possessed several advantages over the two-storey hive in general use. It was more convenient for handling during the honey season, as the brood is in all cases in the frames near the door, and which are covered by the smaller portion of the lid. As the honey is stored behind the brood frames, it can be got at by removing the back part of the lid, and without disturbing the brood. This was a great advantage, as it avoids the necessity for coming into contact with most of the angry bees. If the brood combs need to be handled or moved, they can be got at by removing the front cover. This is a convenience when brood combs are wanted to build up a weak colony. With a two-storey hive it would be necessary to remove all the frames and the top storey to secure a frame of brood comb from the bottom part of the hive. Then, again, the frames, being side by side, were not stuck together by wax—a frequent cause of trouble in the two-storey hive, resulting in bees being killed by putting in new frames. At any time they could, by removing the lid attend to any frame or portion of the hive—an important matter when dealing with the bee moth. Then, again, if the bees require to be fed at any time, three or four frames can be removed from the back, leaving room to place the food, and without causing bees to start robbing each other. He found the bees made better progress in these hives than in the two-storey hive, filling each frame before starting on the next. In the old hives, he had noticed the bees hanging down in the bottom box, until forced out for want of room, before starting in the top box. With the frames side by side they would have been three or four combs to the good. Bees can be wintered in his hive with the best results. If the swarm is a little weak, it can be cushioned up to half the box by use of a chaff-cushion board. He had been using this kind of hive for fourteen years side by side with others, and was satisfied of its all-round superiority. Mr. Bowman explained the manufacture of his hive by means of diagrams. In reply to questions he said the redgum gave the best-flavoured honey in that locality; whereas, where stringybark predominates, the honey was darker and not so well flavoured.

Saddleworth, May 20.

Present—Messrs. Frost (chair), Bee, Benger, J. H. and T. Eckermann, Scales, Hannaford, and Coleman (Hon. Sec.).

Size of Wheat Bags.—Attention was drawn to a report that the present size of wheat bag was too large for lumpers and others to handle without risk of strain. Members consider that the present size of bag is satisfactory, and that a shorter bag or a long narrow bag would both be inconvenient to handle, fill, load, or stack. Wheat bags were easier to carry and handle than manure bags containing ¼ cwt. less.

Weight per Bushel of Wheat.—A report of the action of the Kapunda Branch was read, and matter discussed. The fixing of the standard so late in the season was condemned, and the difference in weight when same sample of wheat was weighed on different small weighing machines was referred to. The height from which the wheat is poured into the measure, and the shape of the striking bar, whether round or square, as well as the manner of striking off the wheat, all must affect the weight. When these slight differences are multiplied many times in getting the weight per bushel, differences must occur

The following motion was carried:—"This Branch approves of a fixed standard of 60 lb. for a bushel of wheat." The Hon. Secretary's amendment, that the standard be 64 lb. per bushel and the farmer to give 1 lb. of wheat extra for every 1 lb. under the standard of 64 lb., found no seconder. The latter part of the amendment, suggested first by Mr. Bee, was, however, approved.

Bags as Wheat.—The loss on wheat bags was referred to, but if the remark of Mr. Pascoe, of Kapunda Branch, that he got 1d. per bushel more if he sold than if he had the bags returned, applies generally, there is little loss. In any case, the grower pays any loss there may be in providing a vessel to market his produce in.

Brinkworth, May 6.

Present—Messrs. Everett (chair), Brinkworth, McAllen, Hill, Ottens, Morrison, McEwin, Wilke, and Stott (Hon. Sec.).

Membership.—Alterations in membership rules proposed by Wilmington Branch were approved.

Dairying.—Mr. A. L. McEwin read a paper on dairying. The little experience he had had in keeping cows in this district was that it cost more than their produce would realise. Compared with sheep, the latter would come out on top, both as regards returns and the labour involved. The labour involved in dairying was never ending, and often had to be carried out under unpleasant conditions. He considered that on their farms they could keep 150 ewes on the feed required for 30 cows, and certainly, on the prices realised of late years for lambs, the sheep would return a much greater profit. He admitted that, looked at in the light of which would be of most benefit to the State, the cows would come first, as it would require a much greater expenditure of money and labour to secure the returns; in fact, his experience was that it cost fully twenty shillings to produce £1 worth of produce. He had come to the conclusion that on these plains dairying was not profitable as an industry, though every farmer can with advantage keep sufficient cows to supply his own needs. No properly conducted farm should ever require to send regularly at any season of the year to market for butter, as in the flush of the year sufficient butter to carry them through the dry weather should be salted and stored away. This had always been the practice on his farm, and he considered good salt butter much preferable to inferior fresh butter. He believed the heat affected the milk supply even more than severe cold weather, as the cows did not eat to any extent during the day, simply lying in the shade and drinking freely of water. Even during the few weeks of warm weather early in April his cows, though in good condition, fell off 50 per cent. in their milk.

Quorn, April 31.

Present—Messrs. Thompson (chair), Toll, Smith, Noll, McColl, Cook, Herde, Brewster, and Walker (Hon. Sec.).

Membership.—Alterations in membership rules suggested by Wilmington Branch were approved, as members thought, though difficulty was experienced by some of the Branches in keeping their roll full, provision should be made for more populous localities.

Disc Cultivator.—Mr. Toll gave an account of the work of this implement. It was the best implement he had ever used for the work it was intended for. Even on hard ground it did first-class work, destroying weeds and covering the seed nicely. It was not intended to take the place of the plough; but for after cultivation or working the fallow it could not be beaten. Messrs. Noll and McColl both spoke well of the implement for preparing the land for seeding. Members were invited by Mr. Toll to inspect the implement while at work.

Richman's Creek, April 25.

PRESENT—Messrs. Freebairn (chair), Nicholson, Gebert, Lehmann, Wright, Roberts, Knauerhase, McSkimming, Hilder, H. and J. M. Kelly (Hon. Sec.), and one visitor.

MEMBERSHIP.—Proposals of Wilmington Branch for alterations in membership rules met with approval.

WORKING HORSES WITH BACKBANDS.—In reply to question as to whether horses worked with backbands were less liable to sore shoulders than horses worked without, members considered it preferable to use backbands.

KEEPING SHEEP IN THE NORTH.—Mr. F. H. Lehmann read a paper on "Will it Pay to keep Sheep on 1,000 acres or under?" He thought it would pay a farmer with 1,000 acres of land to keep a few sheep to convert into cash feed that would otherwise be wasted. Presuming that the farmer was working on the usual system of two paddocks under crop and one in fallow, he would probably have three 240-acre blocks, with the balance of the area occupied by building, yards, and small paddocks. If the paddock fences are of three wires, with posts not more than 15 ft. apart, and in good condition, it will cost £14 12s. to make it sheep-proof, viz., 2¾ miles No. 10 wire, £6 12s.; and labour, £8 12s. The first paddock sheep-proofed should carry permanent water or be contiguous to it, so that it can be with it. It should be fenced between haytime and harvest, and be ready for the stock by January, or earlier. About 125 6-tooth or full-mouth wethers off shears could be purchased, and the paddock should, if the feed is any good carry them on till the beginning of July, by which time it would be fallowed up. The sheep on the average should be purchased at about 11s., and by July would fetch 16s. if properly managed. Allowing for losses of two sheep, commission, travelling costs, etc., this should leave a profit of £27. On a holding of less than 640 acres he would fence off a 20-acre paddock on which to run 25 to 30 sheep for rations during harvesting operations and through the summer. If the paddock had not been overstocked by horses and cattle during early spring, and is left unstocked for a month or two, it should carry the above sheep—diminishing in numbers each week—for about three months. Ewes can generally be cheaply bought off shears in November, and are then generally in fair condition for killing. Even last November such ewes could have been purchased for 11s. a head, and would, considering prices ruling of late, have provided cheap meat for the farmer's household.

Kapunda, May 7.

PRESENT—Messrs. Shannon (chair) Flavel, Teagle, Banyer, Kerin, Weckert, Pascoe, O'Sullivan, Domeyer, and S. A. and G. Harris (Hon. Sec.).

MEMBERSHIP.—Some discussion on the status of honorary members took place, and it was pointed out by the Chairman that it had been resolved that in filling vacancies in the full membership honorary members should have first claim. Some members thought the adoption of Wilmington Branch suggestions would improve matters. Mr. Domeyer urged the selection of practical men who were likely to take some part in the meetings. The Branch would be a greater success, and its influence for good extended, if every member made it his duty to take a share in the work.

STANDARD SAMPLE AND DOCKING.—This question was again discussed, and strong feeling was expressed at the action of merchants in respect to the docking of wheat under standard, while paying no more for heavier weighing samples. The different weights given by different buyers for the same sample were quoted to show the unreliable character of the tests on which wheat was docked. Mr. Teagle moved that a petition to Parliament be prepared for signature by farmers throughout the State, praying that the necessary legislation be passed for the imperial bushel to be the recognised and only standard for wheat. This was carried unanimously. Some discussion also took place on the bag question.

Lyndoch, May 26.

PRESENT—Messrs Kennedy (chair) Ross, Mitchell, Burge, Warren, E, A., and H Springbett, and one visitor

BUDDING ORANGES —Mr Warren read extract from American report dealing with the value of Citrus trifoliata as stock for citrus trees for damp and frosty districts

BEEKEEPING —Mr J Mitchell read a paper on this subject

HON SECRETARY —Mr E Springbett was appointed Hon Secretary, in place of Mr J Mitchell, who resigned that office

Wilmington, May 25.

PRESENT—Messrs Robertson (chair), Schuppan, Bauer, Maslin, and Payne (Hon Sec), and one visitor

CONGRESS —Delegates were appointed to Annual Congress in September next, and it was resolved that the Chairman bring forward the question of alteration in membership, on lines suggested in circular issued by this Branch

"ROUND BONE" AND "FLAT BONE —Question as to why a flat-boned horse was considered better than a round-boned animal was discussed Mr Maslin said his reason for bringing this forward was that on one occasion he showed a 'round-boned' stallion which was generally admitted to be superior in all other respects to his rivals though the prize was given to a "flat-boned" horse Mr Bischof thought the "flat-boned" horse the stronger in the leg, as the marrow cavity was smaller but Mr F H Lehmann tabled three leg bones of different types, showing that the marrow cavity was larger in the "flat-boned" animal These exhibits created considerable interest, and were very carefully examined by members A hearty vote of thanks was accorded to Mr Lehmann for his trouble, and it was decided to endeavour to secure the leg bones of a blood horse

STRAYING BULLS —In answer to question of how to prevent a bull from getting through fences, most members thought that when an animal has once become a "fencer" there was no practical remedy, and unless he was a valuable beast it would be better to castrate him Careful education when young was advocated as a means of prevention If the young animal was prevented from taking the fences it had a lasting influence [In *The Journal of Agriculture* of November, 1900, and April 1901, we illustrated plans for preventing bulls attempting the fences Both had been recommended as effective on confirmed fence-breakers —ED]

BREAKING IN HORSES —In reply to question, the Chairman considered it imperative that young horses should be "mouthed" before being broken in, but the cruel methods formerly adopted were quite unnecessary All present agreed

Meadows, May 30.

PRESENT—Messrs Ellis (chair), Griggs Pearson, Brooks, W J and C Stone (Hon Sec)

HOMESTEAD MEETING —This meeting was held at Mr W J Stone's homestead at Bull's Creek, members inspecting the buildings and surroundings In the orchard Messrs Griggs and Pearson showed how they would prune various kinds of fruit trees

MEMBERSHIP —Alterations in membership rules suggested by Wilmington Branch met with approval

RAPE —Mr Pearson reported failure with rape Seed was sown in January, February, and at end of March, on land that carried a heavy crop of hay the previous season. Before the rape was sown the land was ploughed up and well worked. Mr. Griggs also reported failure with rape.

Morchard, May 28.

Present—Messrs. Scriven (chair), Forbes, Longbotham, Toop, Reichstein, Kupke, O'Loughlin, Kitto, Kirkland, McDougall, and Beck (Hon. Sec.), and one visitor.

Arbor Day and Treeplanting.—The members are of opinion that it would be to the interest of the State if the Government instituted a compulsory Arbor Day, on the same lines as at present in vogue in Switzerland and in other places. Mr. Kirkland read a paper on planting of trees and shrubs about the homestead. He thought every farmer should undertake this work not only to improve the appearance of his home, but also to provide shelter against both heat and cold for his stock. If he were to plant a fair number of trees each year and look after them he would secure a fair amount of success. In planting on limestone soil, the crust of limestone should be broken through. A lot of failures were due to neglect of this point. The young trees should be protected by netting from stock and vermin, and, where frosts are likely, by a piece of bagging. In this district he would advise planting the sugar gum, pepper tree, sheaoak, olive, tamarisk, tagosaste, and the "blue berry." It was better to raise the plants on the farm than to obtain them from a distance. Seeds should be sown in boxes of light soil in December or January and kept moist. By the time the danger of frost was over the young plants would be large enough to set out. Mr. Kirkland distributed seeds of different trees amongst members.

Show.—It was decided to arrange for show of products of the district on August 24.

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CIDER-MAKING.

RESULTS OF INVESTIGATIONS BY F. J. LLOYD, F.C.S., F.I.C.

(Continued from page 568).

The Apple Juice.

The moment the apple juice comes from the press its specific gravity should be taken and recorded; it is then possible to say with a fair degree of accuracy what amount of solids the juice contains and what amount of alcohol the cider made from it may contain. Thus if the hydrometer shows that the juice contains 15 per cent. solids, we know that two or three parts of this will not be fermentable, so that about 12 per cent. remains to be fermented. This will yield half its weight of alcohol. If the cider is not to be fermented to dryness, then the amount of alcohol can be estimated as follows: Suppose 4 per cent. of sugar is to be left in the juice, this will leave only 8 per cent. of sugar to be fermented into alcohol, which halved will give roughly the percentage of alcohol that will be formed.

The chemical composition of the juice has already been spoken of. We now have to consider why it is this juice ferments. Growing on the skins of the apples there are many of those minute vegetables known as yeasts, and during the gathering of the apples and their subsequent treatment these and other organisms have found their way into the juice, and they start in the juice that remarkable change known as fermentation. What that change is will be more fully described later on. Suffice it to say here that during this fermentation the sugar in the juice is converted into alcohol and carbonic acid gas.

From repeated observations of the fermenting juice it would appear that many different kinds of yeast are present and are all hard at work converting the sugar into alcohol. *Saccharomyces cerevisiae* and *ellipsoideus* seem to predominate, but *S. apiculatus* and *S. pastorianus* are also there, with Torulas and moulds and bacteria, a heterogenous host of workers As the sugar gradually disappears and the alcohol increases, a struggle for existence commences among these organisms. Certain organisms succumb, suppressed by more vigorous species, and also due it may be to the presence of alcohol, to the want of food, or, as seems highly probable, to the presence of those unfermentable constituents of the fruit, which, while not injurious to the yeasts naturally present on that fruit, may be injurious to other organisms.

This *primary* fermentation has, therefore, been exercising a selective influence on the yeasts and bacteria, until in the well-fermented juice but few varieties remain. The work they have to do, however, is important; no longer are they required to make alcohol, but by a secondary fermentation to convert the materials left at their disposal into those aromatic and flavouring constituents which shall finally ensure the liquid being converted into cider The primary fermentation, or the conversion of the sugar into alcohol, first needs our consideration. It will gradually, or rapidly, proceed, until at last all the sugar is converted into alcohol, unless special means be taken to prevent this result.

Three questions have arisen from these facts and received attention. First, should the cider be allowed to ferment to dryness, by which term is meant until all the sugar has disappeared, before it is bunged down for ripening? Second, if not, then how much sugar should still be left in the unfermented juice when the cask is bunged down? And, thirdly, do the lees or grounds play any part in the ripening of the cider; or will a better cider be obtained by removing them before bunging down?

The answers to these three questions are briefly as follows:—1. The cider should not be allowed to ferment to dryness; 2. The amount of sugar which should be present when steps are taken to check the fermentation must depend on the kind of cider required; and, 3. The lees play no important part in the production of quality, and the best cider is obtained by removing them at the right time.

We now have to consider how best to attain these ends. And here it may be stated that the most important subject of all is to know how to check fermentation so that it may be completely under our control.

CLARIFYING THE JUICE.

The juice as it comes from the press is a thick, syrupy liquid, holding much matter in suspension. It must be taken to the barrels or keeves where it is next to be treated. This was first done by a rotary reversible racking pump; it saves an immense amount of time and labour, and is a most valuable implement indeed, indispensable in cider-making. Subsequently a semi-rotary pump was employed, as it was found easier to work.

The custom in vogue when these experiments were started was to put the juice direct from the press into barrels and allow it to ferment. Some people hold the view that during this process of fermentation a portion of the solid matter which is in suspension in the juice passes into solution. After repeated experiments I am unable to find any proof of such solution taking place. The chief object of the modern cider-maker is, therefore, to free the juice of this suspended matter as soon as possible after it comes from the press, and so to check or prevent tumultuous fermentation.

The first attempt to this end was made by filling the barrels quite full of juice, so that as the juice fermented the pomace worked out of the bung hole. The barrels were kept full by the addition from time to time of fresh juice. This is both an ineffectual and a dirty method. It is ineffectual because it is impossible to get all the head out of the juice, much of it clings to the sides and under the top of the barrel and subsequently sinks. Moreover, the sediment which is also formed remains in the barrel. Hence, by this method it is impossible to clarify the juice or to control the fermentation. The system is also dirty; the froth works out over the cask, soaks the floor around the casks, and supplies nutriment for organisms injurious to cider, which may be subsequently disseminated into the atmosphere of the cellar and contaminate all the cider.

Many experiments have therefore been made to determine how best to clarify the juice after it came from the press. The first attempts were to filter it by means of bags of cloth made in the shape of an inverted cone. It was found that the juice would not pass through the bags in a clear state unless they were of very fine material, and then filtration was too slow to be useful. In order to use a coarser cloth it was necessary to precipitate the suspended matter, and for this purpose separated milk was employed. Even then filtration was slow, and the juice became exposed to the air to an extent that was undesirable. Moreover, the use of milk necessarily introduces into the apple juice the lactic acid bacteria, which, if they subsequently develop, give an acid and unpleasant taste to the resulting cider. Hence the use of filtering bags had to be abandoned.

Experiments were subsequently tried with a filter used in France, and known as Maignen's filter (Fig. 8). This is an asbestos filter. The asbestos cloth, made up into a sac (Fig. i.), is arranged in the form of a concertina (Fig. ii.) by means of discs inside (Fig. iii.) and cords (Figs. iv. and v.) outside. One end is tightly closed (Fig. vi.), the other end is terminated by a metallic nozzle with union (Fig. vii.). This filter is intended to be used as soon as the juice comes from the press. The filter is placed in a tub which receives the juice. Then by means of the union attached to the pipe of the pump the juice is forcibly drawn by suction through the asbestos cloth from the outside to the inside, passing through into the cask clear and bright. Experiments proved that the juice as it came from the press could not be passed through this filter with sufficient rapidity for practical purposes.

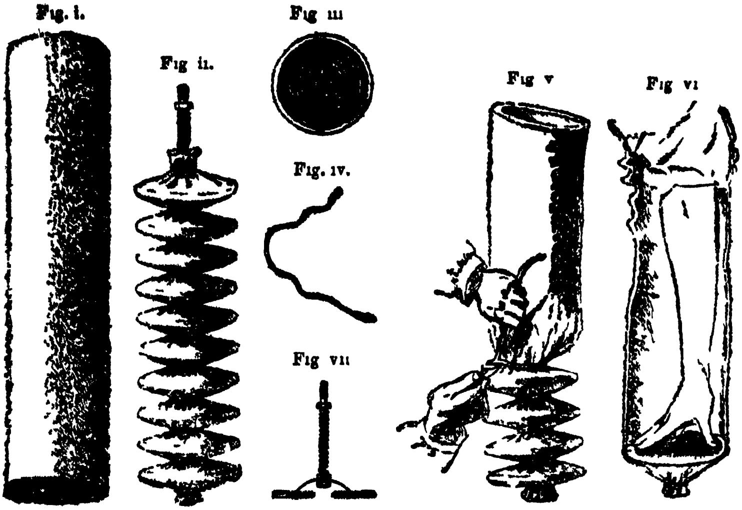
Fig. i. Fig ii. Fig iii Fig. iv. Fig v Fig vi Fig vii

Fig 8 Maignen's Asbestos Cloth Filter

Experiments were subsequently made with the Invicta filter (Fig 9). Filtration was possible, but far too slow and if the filtration were well done the filtered juice would not ferment. Many other experiments were made to purify the juice as it came from the press but without success. It was then determined to try and utilise nature's own forces for this purpose, and experiments were started with the keeving system.

Keeving is probably known to all those who take an interest in cider-making. It was originally done in a large open vessel called a keeve. This keeve may be of varying size and shape. The best shape is that of an inverted cone, with a large bottom and a small top. The top should be open and should have a cover loosely fitting over it. If a specially made keeve is not at hand a "pipe" with the head taken out will do for keeving and the head of the cask will do fairly well as a cover. Such were the keeves used at Butleigh. The principle of keeving may be described as follows.

The yeasts which cause the fermentation of the apple juice grow on the skin of the apple. When the juice is placed in the keeve the yeasts begin to act upon the sugar, changing it into alcohol and carbonic acid gas. This gas, being formed in the immediate vicinity of the pieces of apple skin, etc., present in the juice, becomes attached to them and gradually accumulates to such an extent as to float the solid particles and slowly carry them up to the surface of the liquid. In the course of from 12 to 24 hours, or longer, according to the temperature of the juice, and of the atmosphere of the keeving-room, a scum forms upon the surface, consisting of these particles of skin and pomace. This scum, or, as it is technically called, "head" rapidly increases in thickness, and gradually becomes dry and cracks: soon after which it loses its power of floating upon the surface, and if not promptly removed would sink again into the juice. The object of keeving is to get rid of this head before it sinks. This is done in the open keeves by skimming, and in the closed keeves by racking. The skimming, which may be performed with a skimmer similar to that used for skimming cream off milk, should be done as rapidly as possible, and the cover immediately replaced upon the keeve. In the open keeves a second head soon forms after the removal of the first, and this in due course is skimmed off, as also, if necessary, a third head. The juice is now tolerably clear, for not only have the heads been removed, but a large quantity of the matter which was in suspension will have sunk to the bottom of the keeve. The partly clarified juice may then be racked or syphoned into casks. Great care must be taken not to disturb the sediment. Thus, by keeving, the first or tempestuous fermentation is used in order to partly clarify the apple juice.

It should be the object of every cider-maker to keep his apple juice and cider free from contact with the atmosphere. This cannot be done completely when keeving, but it may be done partly. Thus, the keeve should not be filled more than five-sixths full, so as to leave a good space between the surface of the apple juice and the top of the keeve. The keeve should be loosely covered over with a wooden cover to prevent draughts of air getting at it. Then the space above the fermenting apple juice soon becomes filled with the carbonic acid gas which is being given off from the fermenting juice. This gas, being heavier than the atmosphere, lies upon the top of the juice (provided no draughts are allowed to play upon it and blow it away,) and acts as a preservative.

With care in carrying out this process the results are well worth the trouble entailed. The juice is not only considerably clarified -and to get the juice clear must be the constant effort of the cider-maker—but the subsequent fermentation is slower, more regular, and therefore capable of being better controlled. When the juice was at a temperature of 40 deg. Fahr. no head would form in the keeve, fermentation being at a standstill. Observations as to the effect of temperature have been made regularly, and it is evident that unless the juice is at a temperature of about 50 52 deg. Fahr., or can be kept in a room artificially heated, so that it will gradually rise to this temperature, and a head rise, it is not advisable to keeve the juice, for no beneficial results would follow.

The desirability of keeving is so great, and the necessity of keeping the keeves at a moderate and uniform temperature is so evident, that, where possible, a small keeving-room should be provided, containing a slow combustion "Tortoise" stove by which to regulate the temperature in case of frost; but the great difficulty is to cool the juice when the weather is too hot. Such a room should be above the storing cellar.

The object of keeving being to clear the juice, it is evident that the best guide as to whether, and when, keeving has proceeded far enough is the condition or clearness of the juice. Now it is not possible to see this except after removing each "head," while the proper moment might arrive before the "head" was removed. A wooden tap should, therefore, be placed in the centre of each keeve. This enables a tumblerful of the juice to be removed at regular intervals without disturbing the head or necessitating its being first skimmed off, and from the condition of this sample it is easy to determine when the juice may be racked into the barrels

In drawing off from the keeve it is most necessary to avoid disturbing the sediment. This may be accomplished by inserting into the end of the indiarubber hose which dips into the keeve one arm of a piece of metal tubing bent in the shape of a U. The juice is then sucked downwards into the other arm, whereas, if the tube is merely dipped into the keeve, say, within six inches of the bottom, and the juice sucked upwards, the current of liquid sweeping over the surface of the deposited pomace will gradually disturb it and cause it to be drawn up into the tube, thereby partly destroying the result which ought to be gained by keeving.

The juice is drawn from the keeves either by means of the semi-rotary pump, or, better still, by mere syphon action (if the keeves are in an upper room) into the barrels in the cider cellar.

FERMENTATION IN KEEVES.

Usually a thick brown head is formed upon the juice in a keeve. Throughout the whole of the season 1897, the juice, except in two instances, refused to throw up this brown head, and produced instead a thick white and frothy head, somewhat similar to that seen upon a brewer's vat. In the two instances where brown heads were formed I was unable to determine why they were produced. When this brown head was obtained the juice was drawn off into barrels, the lees were left in the keeve, and new juice was pumped upon these lees; this, however, produced a white, frothy head, similar to that in the remaining keeves. Again, in 1898, the fermentation of the juice in the keeves produced abundant white frothy heads instead of the brown heads of former years, and since then brown heads have been the exception rather than the rule. In nearly every work on cider we read, and those who are best acquainted with the art say, that "fermentation is not good if the froth is white and full of gas" (P. Hubert). Therefore, continuous and numerous experiments were made to discover the cause of this phenomenon.

Why is a white, frothy head considered undesirable? The universal opinion is that cider showing this peculiarity will not keep. To test this question of keeping some experiments were made. Two juices from cheeses pressed about the same day and from keeves standing side by side, one having a brown head, and the other a white, frothy head, were placed in barrels side by side and kept under the same conditions. In due course they were carefully examined, and the cider from the juice having the white, frothy head was not considered to be in any degree inferior to that made from the juice with the brown head. In fact, I may go so far as to say that by some it was considered better. This experiment has been fully confirmed in subsequent years, and my investigations do not support the assumption that a white, frothy head is injurious. The cause of this frothy fermentation is still uncertain.

Some negative results as showing what does not produce the frothy head may first be mentioned. It is not due to the temperature of the juice in the keeve. Experiments were made at high and low temperatures without the least effect. The fermentation, however, both in the keeve and subsequently in the barrel, was much slower when the juice was keeved at a low temperature. The difficulty is to explain why the pomace does not rise. It is said that the reason why the pomace rises to form the brown head is that the yeast cells being attached to the skins of the apples when they start fermentation produce sufficient gas to cause these particles of apple skin to rise. We may therefore assume that when the head is white and the apple skin does not rise the yeast cells have become detached or washed from the skin and are free in the juice, so that the gas ascends alone. If this view were correct, climatic conditions would materially affect the results. For if some of the yeast cells are capable of being washed from the skins of the apples one would expect that they would be so washed away in a wet season; while in a season like 1897, when white heads were the rule owing to the very small rainfall in October, they would remain on the apples until washed off in the juice from the press. In some respects this assumption is borne out by the results of observations. Thus, if the yeast cells were spread throughout the liquid, one would expect fermentation to be more rapid than if they were attached to the skins of the apples. Undoubtedly, fermentation in the keeves is more rapid than usual when there is a white head.

Another possible cause might be the presence in the juice of a top fermentation yeast. Microscopical examination of the white, frothy heads showed them to contain not only an abundance of yeast cells, but also numerous bacteria. It occurred to me that perhaps a combination of the bacteria of lactic or acetic acid fermentation with the yeast fermentation caused the white head. Some experiments were consequently made in the laboratory at Butleigh, and apple juice was inoculated with yeast and one or other of these bacteria, but the result was disappointing, as no frothy fermentation was obtained. Whether and how far it may be due to the influence of season is yet uncertain. Meantime, everything points in the direction of its being due either to this cause or to the presence on the apples of certain varieties of yeasts. After analysing the separate varieties of apples in 1897 the juice from each variety was allowed to ferment. Of the forty-seven varieties only two produced brown heads. This, I think, does away with the supposition that the white head can be due to any peculiarity in the composition of the juice of the apples, and forces us to the conclusion that it must be due to the yeasts on the apples.

Pasteur wrote:—"*La levure n'est mûre que quand le raisin est mur.*" The yeast is only ripe when the grape is ripe. It occurred to me that the same might be true of the yeasts which are found upon the apple, and if so we should certainly expect the yeasts to have been fully ripe in the season of

1898, as also in that of 1897. Being thus ripe they would naturally have a more powerful action than in a season when they were not ripe, and this might account for the rapid fermentation of the juice. Whether it would also account for the production of a white head yet remains to be proved. So far as can be judged a white head does not appear to be entirely due to the juice as it comes from the press, containing less pomace than in former years, though this may partly account for it. Undoubtedly the greater care exercised each year has been productive of a cleaner juice, if only from the diminished number of rotten apples used, and each year has seen white heads more prevalent than in the early years of these investigations.

Though we have not discovered the cause of these white heads we can say with some certainty what are the results, viz., a rapid fermentation, and a tendency for the cider to become acid. Hence, one can well understand why this white frothy fermentation has obtained a bad repute. It is, as a rule, a sign of rapid fermentation in the juice, not only while in the keeve, but subsequently when in the barrel. Therefore, it is imperative to watch the fermenting juice, to rack it sooner and more frequently than juice which ferments slowly, and to keep the air away from it with scrupulous care. But these are just the rules which the careless cider-maker will not observe. He uses no hydrometer to tell him how the fermentation is proceeding, and so he leaves the juice to proceed as it will until the time which he thinks proper for racking arrives—a time which frequently does not depend upon the condition of the juice at all.

In 1898 the fermentation was so rapid that it was difficult to deal with the juice. Fortunately, the constant use of the hydrometer, by which the rate of fermentation in every barrel was watched, here proved of great service, for it enabled the maker to judge which barrel first needed racking, and how often to rack in order to obtain the juice at the right gravity for filtration. But cider-makers are no more able to do two things at once than are other people; hence, if it is found necessary to commence racking some of the juice, the process of grinding and pressing must be postponed until this racking has taken place.

Probably in ordinary practice the white-headed fermentation is most injurious because cider-makers will neither use the hydrometer nor stop making in order to attend to the juice which has been fermenting, and is fit for racking. It has been found by experiment that when white heads are formed and rapid fermentation is the rule it is necessary to keep the temperature of the keeve room low. If once the juice throws up a white, frothy head there is no object in keeping it in the keeve, for, keep it there as you may, it will not subsequently throw up a brown head. As soon, therefore, as the juice begins to clear, and the main portion of the pomace has subsided, it is best to rack it off into barrels, taking care, of course, not to disturb the sediment. Watch the subsequent fermentation, and do not let the air get at the juice. Rack at the earliest opportunity, and, if necessary, repeat the racking, and finally filter. Then if the juice be kept in airtight barrels, there should be little fear of the cider becoming too acid or too dry.

TREATMENT OF JUICE FROM KEEVE.

The juice after keeving may be treated in one of several ways. The following three methods have been tried during these experiments:—

1. It may be partly or imperfectly filtered, placed in barrels, and then allowed to ferment.
2. It may be very thoroughly filtered, and must then be inoculated with special yeasts.
3. It may be pumped direct from the keeve into a barrel and allowed to continue fermentation.

(1) The filtration of the juice as it comes from the keeve may be done either by Maignen's filter or by the Invicta filter.

If the juice is first keeved and skimmed it is found to pass through Maignen's filter with a fair amount of rapidity. As there can be no doubt that the purer the juice before it is put into the fermenting barrel the better the resulting cider, it is evident that this filter supplies a want, being both cheap and efficacious, though slow. It is not suitable for the filtration of the fermented juice, because when this is filtered it is specially necessary to keep it, so far as possible, from exposure to the air. It is undesirable to allow the apple juice as it comes from the keeve to come in contact with the air, and it is still less desirable after subsequent fermentation. The juice as it comes from the keeve is saturated with carbonic acid gas, and throughout the whole process of cider-making it must be the constant effort of the maker to retain this gas in the cider. Even when simply racking from the keeve into the barrel this point must not be lost sight of, and the end of the racking pipe must go to the bottom of the receiving barrel so that the juice flows in with as little disturbance as possible.

The only filter with which I am acquainted that enables the juice to be filtered without giving up its carbonic acid gas is the "Invicta." It has been used throughout for the experiments made at Butleigh, and whenever reference is made in this report to filtration it will be understood to refer to filtration through the "Invicta" filter, unless otherwise stated. The filter consists of a strong metal drum, into which the liquid is pumped with the rotary pump. On either side of the drum there is a series of perforated metal discs and wire-gauze sieves, and between these is placed a thick layer of "fibrous paper pulp," which acts as the filtering medium, and retains on its surface or in its pores all the solid constituents of the juice. The cider or juice is visible as it enters the filter, and again as it leaves it, so that the degree of purification can be watched; and should the filter, from any cause, fail to act properly, this is immediately noticeable. Experiments soon proved that this filter performed its work in a most admirable manner. Apple juice as it came from the press was put through it and taken direct to the barrel, which, when full, was loosely bunged. The apple juice came from the filter as clear as sherry, and so thoroughly was the juice filtered that no fermentation took place in this barrel for four weeks. But if the filtration was perfect it was not easy. Pressure on the pump rose to 10 lb. to the square inch, and the filter began to act more and more slowly as the work proceeded, so that after filtering 50 gallons it was necessary to clean out the filter before starting again.

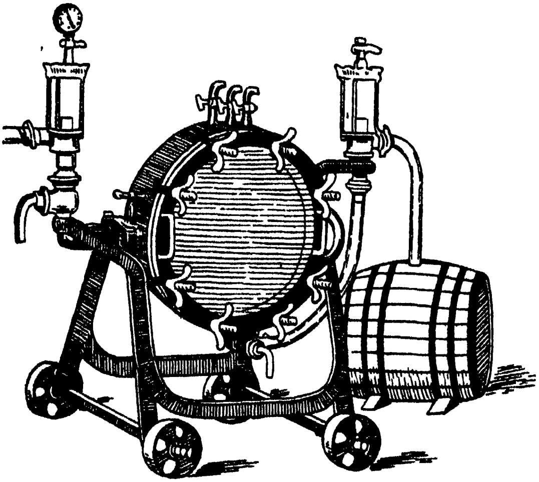

Fig. 9.—The Invicta Filter.

A partial filtration of the juice as it comes from the keeve is not so difficult as the filtration of the juice from press if there has been a proper clearing in keeve. This clearing does not always take place, and sometimes one keeve will clear better than others. When, therefore, only a portion of the juice is required to be filtered at this stage, it is well to select only such as has naturally cleared well in keeve. It has been found impracticable to filter all the juice at this stage.

(2) The second method of treating the juice, namely, by thorough filtration and subsequent inoculation with pure yeasts, will be treated when considering the action of pure yeasts.

(3) Finding that filtration of the juice from keeve was impracticable on a large scale, the third system was finally adopted at Butleigh, namely, to rack or pump the juice direct from the keeve into the fermenting barrel. The composition of the juice when racked from the keeve into the barrels varies greatly; the percentage of alcohol ranges from .30 to 1.00 per cent., but the main portion of the sugar is still present in the juice unaltered. As in the keeve so in the subsequent stages of fermentation the conversion of this sugar into alcohol is attended with the production of a large volume of carbonic acid gas.

One of the first questions which arises in the treatment of the fermenting juice is: Should this gas be allowed to escape or should the casks be bunged down tight as soon as filled? Looking at this question from a purely scientific standpoint it seemed to me preposterous to bung down the casks as soon as they were filled. Apparently one of two results must take place: either the fermentation must be stopped, owing perhaps to the pressure exerted by the carbonic acid gas produced in the barrel, or, if fermentation proceeded, then the amount of gas formed would be sufficient to burst the barrel or cause it to leak.

A barrel was bunged down as an experiment, and as it did not burst I naturally concluded that the pressure had been sufficient to stop fermentation. After a while a sample was drawn and analysed, and the following results obtained:—

Composition of Juice in a Barrel Bunged Down.

—	Sp. Gr.	Acid.	Alcohol.	Sugar.	Total Solids.
Juice when racked into barrel	1·052	·70	—	10·80	12·82
After two months ...	1·010	·85	4·55	1·87	3·80

Thus it is seen that fermentation had proceeded just as if the barrel had been open. In fact, when compared with the barrel next filled, from which the gas was allowed to escape, it was found that fermentation proceeded more slowly in the barrel not bunged down.

Composition of Juice in a Barrel not Bunged Down.

—	Sp. Gr.	Acid.	Alcohol.	Sugar.	Total Solids.
Juice when racked into barrel	1·052	·44	—	11·23	12·92
After two months ..	1·018	·73	3·80	3·78	5·30

From these figures it is evident that fermentation had proceeded in the tightly bunged down juice just as if the barrel had been merely closed with an air-excluding bung, and the gas allowed to escape. But how had the gas escaped, for it certainly had been formed, and was not present in the juice? To determine this point two barrels were fitted up with pressure gauges, filled with juice, and bunged down. The pressure rose rapidly, and in about from two to three days amounted to 2 lb. on the square inch. Beyond this the pressure did not rise. So far as one could judge, it seemed to fluctuate very slightly from day to day. The only explanation of these facts is that when the pressure reaches 2 lb. to the square inch the staves of the barrel where not in contact with the liquid must permit of some gas escaping. The pressure immediately falls again very slightly, then rises until once more it is sufficient to open the staves and allow the gas to obtain an exit. This would account for the slight fluctuations noticeable in the pressure. [illegible]

in two barrels of juice, made on the same day, one of which contained an air-excluding bung only; the other was bunged down tight, and a pressure gauge indicated a pressure in the barrel of 2 lb. to the square inch.

Composition of Two Barrels of Cider, one Bunged Down with Pressure Gauge in, the other with Air-excluding Bung.

1.—Bunged with Air-excluding Bung.

Date.	Sp. Gr.	Alcohol	Acid.
6th December . .	1·0205	3·60	·68
17th January ..	1·0080	4·90	·73

2.—Bunged Tight; Pressure Gauge indicating Two Pounds to Square Inch.

Date.	Sp. Gr.	Alcohol.	Acid.
6th December	1·0210	3·60	·64
17th January	1·0075	4·95	·77

It is somewhat remarkable that in the above experiment, as also in the one previously referred to, fermentation proceeded more rapidly in the juice under pressure. We may therefore conclude that when the keeved juice is placed in the barrels it is desirable that the gas produced by fermentation should be allowed to escape, while at the same time air should be excluded.

The most simple method of attaining this end is to close the barrel with a bung into which one end of a piece of composition tubing, about one foot in length, is carefully fixed. The bung is fastened securely into the barrel, the tube then bent round so that the end comes about two inches above the top of the barrel, and under this end is placed a tumbler of water into which the end of the tube dips. This arrangement was found satisfactory, and has the advantage of being cheap and easily fitted up. A better plan is to use tinned-iron pipes, which can be screwed securely into the wooden shives, or bungs, and a piece of indiarubber tubing placed on the other end of the tube allows the tumbler of water to be easily put in position or removed. By this means all the escaping gas bubbles through the water, while no air can gain access to the barrel. Moreover, by watching the rate at which the gas bubbles through the water a good idea may be obtained as to the rate at which fermentation is proceeding. In my experiments a bung of special form (Fig. 10) was frequently used, which was made for me in Mr. Neville Grenville's workshop. As it is of special value in experiments it may be described. It consisted of a round, hollow, wooden bung about four-fifths of an inch long, with central opening of about one inch in diameter; outside the bung there was a cup, about two inches deep. It was all turned out of one piece of wood. This cup was filled with water, and a common glass tumbler inserted over the bung in the cup of water. The following cut shows a section of the bung:—

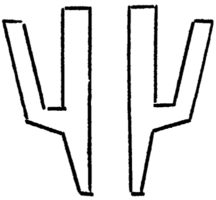

Fig. 10.—Section of Special Bung used in Experiments.

The chief value of this bung is that it enables one to draw off samples as required, by passing a glass tube or syphon down the centre, and without disturbing the bung. Hence, there is little risk of admitting air to the cider, and the tumbler is rapidly replaced after the sample is taken.

FERMENTATION IN BARRELS.

The juice after it is placed in the barrels continues to undergo fermentation, the sugar being gradually converted into alcohol and a sediment forming in the barrel which is known as the "lees." The common practice of the country hitherto has been to allow fermentation to proceed for so long as it is rapid, which is determined in a rough-and-ready way by placing one's ear to the cask or bunghole, when the rate of development of gas can be roughly estimated. When the fermentation slackens the barrel is bunged down and left. One of two things happens: either the fermentation continues until the whole of the sugar has fermented, or the fermentation ceases from no visible cause, but probably owing to cold weather setting in. In either case it is absolutely uncontrolled and left to chance. This is not a scientific method of making cider, hence it has been abandoned. Before deciding what method should take its place two questions had to be settled by experiment: Should the lees be left in the cider when bunged down for storage? An experiment made in 1894 seemed to indicate that by bunging down on the lees more harm than good would arise, and further experiments made in subsequent years confirmed this result. Hence it is necessary to remove the lees from the cider before bunging down. When and how should they be removed?

(To be continued.)

CODLIN MOTH NOTES.

In a recent bulletin issued by the United States Department of Agriculture, and prepared by its special field agent (Mr. C. B. Simpson), there are many interesting notes of recent investigation into the life history and habits of the codlin moth. The United States Entomologist, in his introductory note, states that the codlin moth is undoubtedly the most serious insect pest of the apple and pear, and is responsible for a greater monetary loss in American orchards than all other insect enemies of the apple and pear combined. Mr. Simpson's work, extending over two years, confirms a discovery made in California some years ago of a buff-coloured variety of the codlin moth. The general ornamentation of the new variety is practically the same as in the darker form, but the colouration is generally a light buff, instead of dark brown. In reference to the food of the codlin moth caterpillar, it is stated that while apples and pears are mainly attacked, many records also show that stone fruits are often infested, though the injury is a mere trifle. Where, however, there is a lack of apples and pears, and the infestation is bad, considerable injury may result, and one or more instances have been recorded of 40 per cent. of injury of peaches on trees adjacent to an apple house in which infested fruit had been stored.

One very important aspect of the life history of the caterpillar is proved, i.e., its leaf-feeding habits. Professor Slingerland announced a few years ago that the eggs of the codlin moth were frequently laid on the leaves and bark, and his observations have since been confirmed by many observers. Recent investigations have shown that where cages have been placed over limbs of apple trees, and moths liberated therein, nearly all the eggs of the first generation were laid on the leaves. Professor Cordley suggests that the moth avoids the young fruits on account of the pubescence, which is, however, lost as the fruit develops. Mr. Simpson states that under ordinary conditions he has often seen fruit, surrounded by leaves, upon which there are no eggs, while several eggs were found upon the upper surfaces of the leaves. A fairly large percentage of eggs of the second generation of moths were laid on the fruit itself. Very few eggs were found upon the under side of the leaves, and it is evident that the moth prefers a smooth surface on which to deposit her eggs. In 1897 Professor Card recorded that young larvæ, especially in confinement, nibbled portions of the leaves. Professor Cordley has found the caterpillar not only eating the leaves, but also tunnelling in the mid-rib of the leaf, and he expresses the opinion, which Mr. Simpson endorses, that the larva could, with proper care, be brought to maturity on a leaf diet alone. This has a most important bearing on the question of spraying.

Dealing with the point of entry into the fruit, Mr. Simpson states that the majority of the first generation undoubtedly enter by the calyx. They either squeeze their way into the calyx between the lobes, or tunnel into the cavity at the base of the lobes. A scar, the stem, or a place where the fruits touch, is often selected as the place of entry. The second generation for the most part enter on the sides of the fruit. The larva crawls rapidly about the apple, seeking a place for entrance; a scar or roughness is a favourite spot, as the jaws slip on the smooth skin. In its wanderings the larva spins a silken thread, and finally makes a web over the surface of the apple. With this as a foothold it is able to make some impression on the skin, which is bitten out in chips and dropped into the web. Later, when it is partly covered, the larva backs out of the burrow and brings pieces out with it. This is repeated until it is entirely within the burrow, when it turns round and spins a silken net over the hole. One of the essential points noted is that *while entering none of the larvæ seem to eat any fruit until well within the burrows*, and it most probably gets some of the poison applied when spraying, when it attempts to pierce the skin. When the larva of the first generation enters the calyx cavity it takes its first meal, and though there is a lack of data as to exactly what is eaten, it probably acts as it does when the side is entered.

On the question of how the caterpillars are poisoned by arsenical sprays, Mr. Simpson makes some exceedingly interesting remarks. Professor Slingerland was the first to answer this question with any degree of accuracy. He stated that the spray lodges in the saucer-like calyx when the young fruit is erect, and upon the segments or leaves of the calyx closing the poison is held there for some time. Poison has been found in the calyx two weeks after the lobes have closed. As about 80 per cent. of the first generation enter the fruit through the calyx it is easily seen how the majority of them might obtain some poison. Mr. Simpson states, however, that the evidence that the larvæ are killed is all indirect, and there are no records of dead larvæ having been found in the calyx. By examining the apples immediately after the blossoms have fallen the calyx proper is seen to consist of two parts. First, the calyx tube, which may be said to be on the interior of the apple, and then the lobes or bases of the lobes which support the stamens. The stamens stand close together and form a sort of roof over the calyx tube. Careful examination immediately after spraying has been done has failed to disclose any particles of poison inside the calyx tube itself. With regard to the second generation, it is generally believed that the larvæ get their poison when they enter the fruit; but the observations of many investigators show that when entering they eat little or none of the fruit. In both sprayed and unsprayed orchards it is quite common to find places where the larvæ have entered and died shortly afterwards. Countings of 426 new entrance holes on sprayed fruit showed an average of 40 per cent. of holes in which the larvæ had died; two countings went up to 70 per cent. On unsprayed trees of 606 new entrances only 11 per cent. showed that the larvæ had died. As there was no accurate way of determining how many of these holes were caused by larvæ which entered where two apples touched, these figures cannot be regarded as reliable. Still, Mr. Simpson is of opinion that 10 per cent. to 15 per cent. of these larvæ succumbed to the effects of the poison. Many times early in the season holes were found which would employ the larvæ for several days, and it is very questionable whether the poison killed the insects in such cases. In regard to the second generation, the larvæ may get some of the poison when their jaws are slipping on the fruit in the attempt to make an entrance, but at best the percentage probably killed in entering the fruit can in no way account for the general efficiency of spraying. Considering the egg-laying habits and leaf-eating habits of the larvæ of both generations, *Mr. Simpson is strongly of opinion that by far the larger number of the larvæ killed by the poison die through eating or nibbling the poisoned leaves before they find the fruits.* This is a new and very important view of the matter, and warrants very careful research on the part of our observers.

Dealing with the life cycle of the codlin moth, Mr. Simpson gives a number of records made by himself and other observers. Professor Gilette found with the summer brood the average period of the different stages is as follows:—Egg to larva, 7 days; larva to cocoon, 19 days; cocoon to emergence of moth, 18 days; from emergence of moth to middle of egg-laying stage, 5 days; or 49 days in all. Mr. Simpson, however, found the different stages somewhat longer, and places the average life cycle at 55 days to 58 days, with a minimum length of 36 days and a maximum of 100 days. Taking the records of various observers into account, and comparing his own with them he has no hesitancy in concluding that there are but two broods in the arid west, and possibly, though by no means certainly, a third generation in the west and south. The great difficulty in determining this question was the over-lapping of the broods. The moths of a given generation would come out over a period of five weeks. If to this is added the maximum record of the life of a codlin moth, viz., 17 days, it may be calculated that between the appearance of the first moth and the disappearance of the last moth of the first generation a period of from 50 to 52 days may elapse. As the minimum cycle from egg to egg again is placed at 36 days, the margin for over-lapping is considerable.

CALIFORNIA PEAR BLIGHT.

Amongst the many troubles Californian fruitgrowers have to contend with probably the disease known as "pear blight" is the most insidious and deadly. This disease is not confined to pears, though those trees appear to suffer most. Apples also suffer severely, while loquats are sometimes attacked. The disease has been known in America for over a hundred years, but it is only during the last ten years or so that its progress in California has been so rapid. Recent bulletins from California deal fully with this trouble. Its symptoms are described—in the worst cases—as follows:—A tree in full vigour will put forth a full crop of blossoms, the young leaves shoot out, and the wood appears bright and healthy. In a few days the blossoms droop, wither, and dry up; the leaves turn brown and crisp; the young wood deadens; and, in many cases, the disease follows down until the branches and trunk are attacked; finally, the whole tree becomes affected and dies back to the ground. Usually the most thrifty trees seem most susceptible to the disease. The point of infection appears in nearly every case to be through the blossom, and there is little doubt that bees and other insects convey the spores of the disease from one flower to another. In many districts, from 50 per cent. to 70 per cent. of the pear trees are affected. In some seasons it is more virulent than in others.

This disease is due to the action of a very minute class of bacteria known to science as Bacillus amylonorus. Experiments have proved that the infection can be conveyed by inoculating a healthy tree with sap from an affected one. "Pear blight" being of bacterial origin, and spreading with the sap through the cambium layer, is thoroughly protected from external influences, and no sprays or fumigation are of value. So far the only measure that has been in any way effective in dealing with "pear blight" has been in the removal and burning of every portion of trees that are affected. This should be done during the dormant season, preferably in the autumn, before the leaves actually drop, as the diseased portions of the tree can be more readily detected then than in the winter. Unless, however, this is done throughout the whole affected area, the treatment will only be temporarily effective. In order to avoid carrying the germs on pruning tools when cutting out diseased branches, some disinfecting fluid should be carried by the operator. Corrosive sublimate, 1 part in 1,000 parts of water, a 5 per cent. solution of carbolic acid, and a solution of 1 part chloride of lime to 20 parts water are recommended. All cuts made on the diseased portion of the tree should also be disinfected.

CANDIED HONEY IN PAPER PACKAGES.

The following figures, taken from our statistical records, show that South Australia produces a considerable quantity of honey, and has developed a fair export trade in that product In 1898 our production reached 886,084 ℔, and our export 60,512 ℔, 1899, production 523,981 ℔, export 100,985 ℔, 1900, production 1,708,133 ℔, export 120,922 ℔, 1901, production 310,758 ℔., export 152,758 ℔ 1902, production 756 822 ℔ export 536,481 ℔ These returns demonstrate very forcibly the extent to which the apiarist is dependent upon the season and also show the extent to which our export trade in honey has developed under interstate free trade While the dietetic value of honey is generally recognised by the medical fraternity it cannot be said that it is as largely consumed by the general public as might be expected, considering its cheapness and nutritive qualities The figures quoted will show that after allowing for export and local use for confectionery, etc the consumption of honey in South Australia per head of population is very small We believe this is to a large extent due to the methods of marketing, and to the want of a cheap and attractive package for honey in small quantities In every branch of trade we see how largely the sale of an article is affected by an attractive label or package That our South Australian honey packages will admit of considerable improvement will not be questioned, and we wish to call attention to the value of the parafined paper or light cardboard receptacle which is becoming so popular in America for candied honey

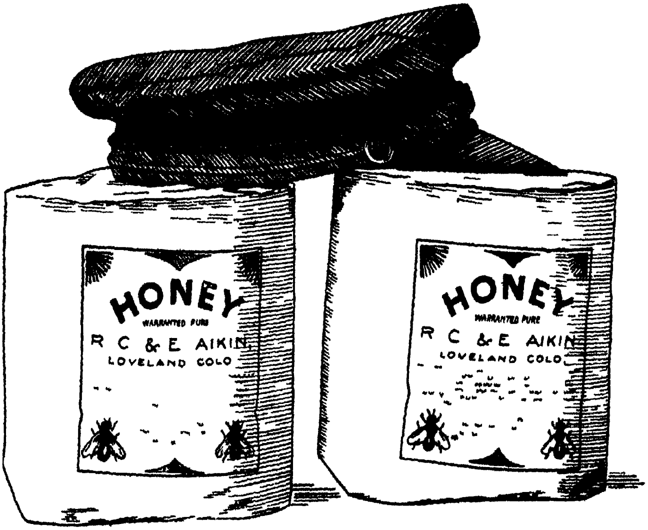

Fig 1.—Candied Honey in 10-℔ Paper Packages

"Gleanings in Bee Culture," the useful little publication issued each fortnight by the A I Root Co, of Medina, Ohio, has devoted considerable space to this question lately, and from it we take the accompanying illustrations of candied honey as put on the market in America The following description of the process of filling the packages and securing that the honey candies is taken from an article in the journal referred to —

First of all in order to have the best quality of candied honey, it is necessary that it is not taken until it is all, or nearly all, capped, and, in the second place, extraction must be done on a dry day as the honey contains more water on a damp day than in dry weather. Extracted honey should be covered as soon as possible, as exposure to the air is injurious. Granulation is hastened, and the grain is much finer and more even if the honey is gently stirred or agitated. The smaller the movements and the slower the motion the better the results. Frequent stirring, with exposure to the air, will result in loss of flavour and aroma. When the time comes for "bagging" or "boxing" the honey, it should be thoroughly stirred from top to bottom. The stirring should be done on a warm, dry day, for two reasons. First, when warm, the mixing can be more thoroughly done; and, second, whatever air is mixed through the honey in the stirring will rise to the surface. The packages should be arranged, and the honey poured in while warm, as it will move more freely than when cold. Where paper packages are used it is advisable to place them in boxes of sufficient depth to just take the packages, so that the honey will harden to the proper shape. With the cardboard packages this is not necessary. The honey, if properly treated, quickly becomes solid, and can then be handled without risk of damage.

The first illustration shows two 10-lb. packages of candied honey, put up in prepared paper packages. These were sent wrapped in newspaper, and packed in an ordinary barrel, right across America by train, and arrived at Root's warehouse in splendid condition.

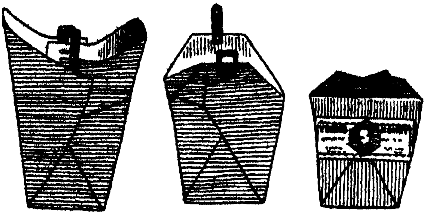

Fig. 2.—"Oyster Pails," used for Candied Honey.

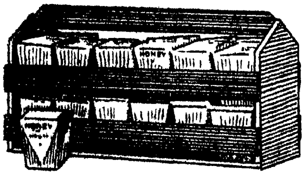

Fig. 3.—Crate of Candied Honey in "Oyster Pails."

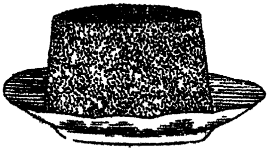

Fig. 4.—Candied Honey after Package has been removed.

The next illustrations show the cardboard packages known as "oyster pails," a crate containing these packages, and a plate of candied honey after the cover has been removed.

American experience shows that low temperature—the colder the better—is the most important condition for the rapid candying of honey, and the question naturally arises: Will the honey keep solid under South Australian conditions? There is little doubt that there would be a ready sale for honey put up in attractive packages like those shown in our illustrations, and the fact that it is as cleanly and as easy to handle as cheese or butter would ensure a favourable reception for it. Mr. A. I. Root, the veteran beekeeper, states that, provided the honey is not exposed too much, it will keep firm under high temperatures; but warm, moist air will cause it to become sticky. He also states that in their retail stores they are selling this honey in paper packages at 6½d. per lb., against 5½d. for the same quality honey in glass jars, jar included. Others who have taken up this trade vouch for the extra demand resulting from the attractive appearance of the candied honey. The cost of these packages is very low. The oyster pail is retailed at the ordinary grocery stores in America at 3s. 1d. per 100, in 1-lb. sizes, and the A. I. Root Company quote for the parafined paper packages, 23s. per 1,000 for 1-lb. and 37s. per 1,000 for 3½-lb. packages. The oyster pail would come considerably cheaper by purchasing in larger quantities from the makers. In any case, the cost is small compared with glass jars. Even the unattractive and troublesome 2-lb. honey tin costs about 8s. per 100. We trust that some of our enterprising bee men or grocers will, if they have not already done so, make a trial of candied honey for the local market.

THE COMMERCIAL ASPECT OF POULTRY FARMING.

By F. B. Rathbone.

[The following paper, read by Mr. F. B. Rathbone, of Davenport Agricultural Bureau, is published here with a view to eliciting criticism, as it deals with poultry farming from an aspect not usually taken by writers on this subject, i.e., that of an individual depending for his income solely on the profits from his poultry. We think that very few writers would advise any one to rely entirely upon poultry for his income under South Australian conditions, though we know that under special conditions some poultry-raisers make a very fair living out of their fowls. It must be understood that we do not endorse Mr. Rathbone's figures; in fact, if criticising them, we would be disposed to note the following points:—1. Expenditure on houses is higher than necessary. 2. The average value of eggs is lower than the average of the past four years. 3. The average return of 132 eggs per hen is high for a large flock, and the owner could consider that his hens had done well should they reach that figure. 4. The cost of wheat and barley is too high, as a man buying in large quantities could get good poultry feed cheaper. 5. Four per cent. interest for depreciation and renewals is absurd; at least 10 per cent. would be necessary. 7. Some of the items in the capital might be questioned.—Ed.]

At the present time it must be acknowledged that poultry farming is occupying a great deal of attention, not only in this State, but throughout Australia. Two reasons can safely be assigned for this, one being the great demand for both eggs and fowls for Western Australia, and the other the high price of meat caused by the drought, which has caused people to consume more poultry, which article has, in sympathy, owing to its scarcity, also greatly risen in price. I am afraid that, given a run of good seasons, which means cheaper meat and a large increase in the numbers of fowls, there will be a set back in prices, and we shall have to look to English markets for an outlet; and although we are constantly told that that market is an unlimited one, we must bear in mind that France, Italy, and Russia are steady and large suppliers of the same, and I much fear that they can do it at prices that will not leave much profit to the Australian grower. At present Australian meat is being sold in London cheaper than we can get it here, and I know of one instance in this town where Mr. Taylor raised and shipped some hundreds of ducks, which, after paying expenses, realised far less than he would have got for them locally. I merely utter this as a note of warning to would-be poultry farmers not to base their calculations on fancy London prices, as, although

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interest on capital.

In this article I propose to deal solely with eggs and fowls at consumers' prices, and do not intend to go into the question of breeding stud stock. If poultry farming is so profitable, why do we not hear of any one who has gone in for it as a business and made money at it? I have studied the question for years, and also experimented in some slight degree, and my conclusion is that to make a profitable business of it the following qualifications are necessary:—1. A man must have a very strong predilection for the business. 2. He must be content to give his whole energy and time to it, to be tied to it week day and Sunday throughout the year. He must be able to think out all details necessary to its success, such as planning and building his yards and runs, shelter for the birds, the necessary supply of grit, green feed, and animal food, the question of water supply and the best form of drinking vessels, the diseases of poultry, their prevention and cure, the management of incubators and the successful rearing of chicks, the suitability of the locality for various breeds, and also the question of capital. Of this he will require not less than £600. And the question will then present itself whether a man with all those qualifications and that capital could not make a better and easier living at something else. However, I believe a living can be made, and the following is the way I should proceed:—I would limit my flock to 800 birds, plus breeders, and allow an acre to each 100, and as there would have to be a good deal of land required for the chicks and growing green feed and a run for a horse, I must put down my farm at 20 acres at least. My flock houses I would build of iron, with angle iron framing, and not a particle of wood should enter therein, except the perches, which would be movable and frequently cleansed. Each house would hold 100 birds, sub-divided into four lots of 25 each. I should have a window, or perhaps two, in each house, and the floor would be asphalted and swept every day. The yards would be square, surrounded by 6-ft. netting, with a thin wire 3 in. from top. If possible, I would use iron standards, and, above all, have good gates, well hung, and capable of admitting a barrow. There is nothing so annoying as to have a gate so narrow that you have to carry things through it, and in dealing with poultry on a large scale it is astonishing how much they eat, and how much manure you have to clear away. In each yard a drinking vessel must be provided, and the best you can have is unglazed earthenware. This can be readily cleansed, and also allows tonics to be mixed with the water, which metal drinking vessels do not. I should certainly advocate having the water laid on to every yard. It is a big initial expenditure, but it saves an immense amount of labour, and that, in a land where high wages prevail, is our only hope of competing against the cheap labour of other countries. If there is no natural shade some must be provided, both for covering the water and also for places of refuge on hot or wet days; also feeding troughs and receptacles for bones and stones. These are essential, as to throw the soft food on wet ground in dirty weather, or dusty in dry, compels the stock to eat a certain amount of tainted ground, which will one day result in an epidemic.

I have now provided for my flock birds, and the question next is, what accommodation must I have for my breeders, as I plan to raise 1,000 chicks every year. If we are going to profitably keep fowls, we must get them to lay a maximum of eggs in a minimum of time, and to do this we must dispose of our layers at the end of the second laying season. I have said at the beginning I am planning to keep 800 layers, but in reality the first year I should only have 400, and to get these I should have to hatch 1,000 chicks. This would allow me to cull or lose 200 in the rearing; and allowing the balance to be pullets, there remains 400 to be sold, and this would go on year by year. Now, to raise 1,000 chicks is not all beer and skittles. It is easy to talk of hatching 90 per cent., but year in and year out if you get 70 per cent. you will do remarkably well, and I fear 50 per cent. will be a surer estimate. Taking, however, 70 per cent. as a basis on fertile eggs, I will want fully 1,600 eggs, and as in incubators you want your eggs as fresh as possible, I should provide myself with five incubators, each to hold 160 eggs, and to fill one of these in five days will require 40 hens, which must average 32 eggs per diem. The pens for these 40 hens I should build on the same lines as my flock pens, only on a smaller scale, allowing eight pens with five hens and a rooster in each. The incubator house should be of stone or brick, free from draughts, but well lit and ventilated. Attached to this I should have a long stone or brick building, the first part entirely enclosed with some means of heating, and gradually extending till it becomes an open shed. I will need eight pens, and these, allowing me to keep my chicks in each four days, will rear them to a month old, when the sexes can be distinguished and separated, the males to be got forward for market as soon as possible, and the hens to be fed with a view to early egg production. I will also require a room for storing the feed, and also a boiler in it for mixing the soft feed, and a chaffcutter, bonemill, and meatcutter. All this runs into money. The green food plot must grow 1 cwt. of feed per day, and for this I think I will require nearly an acre of land.

We now have provided for necessary buildings, and the question arises how to start. I should say, buy eight roosters of any chosen breed, and 40 hens unrelated to them, making certain they are healthy and have no vermin, and then set to work to breed up the first year's 400 layers. And here is a point which must confront every one. This number of stock will not take up his whole time. What is he to do with the balance? In my case I should employ it in building my flock houses and yards, and for this reason in my capital account I have only put down the price of the material. If I am not capable of doing it, I must add the cost of labour to this item. My incubator house, sheds, runs, and small yards must be built before I start. I will thus have four months before I get any return, and then my first items will be the sale of cull chickens and surplus roosters. At the end of six months I can reasonably expect to have some return from the flock birds, but it will not be in full swing. As regards marketing, I should prefer to be near a large town where I can deliver produce, and, if necessary, see it sold. I would drive in in the morning, and on returning get liver, bones, and soft feed, and thus save carriage both ways. Besides, I will not be charged for broken eggs, and will know I am getting the full value of my produce. Of course, in Australia we are all honest, but in some countries I have read of it is by no means an uncommon practice for poultrymen to have account account sales rendered, showing so many birds dead on arrival, and so many eggs broken, which are deducted from the proceeds, and these little items and the cost of carriage in the course of a year total up more than the increased rental of land near a town comes to

I have given a separate account of cost of buildings and stock, and will now proceed to show the profits of the undertaking. Before doing so, however, I would like to point out what is often lost sight of by those who keep a small number of fowls, and that is, to keep going on the scale I have sketched out will entail the carting around in the course of a year no less than 40 tons of food, or equal to 2 cwt. a day, for your flock birds, in addition to what you have to supply your chicks, and you can safely reckon on having to haul away from 10 to 15 tons of manure yearly. This clearly points out the need of some barrow or handcart to take the food around, and hence the necessity of good gates and well-planned yards and buildings. It would only be bewildering to put down the daily rations, weight and cost, but I have carefully considered these matters, and the balance sheet I have prepared will enable you to see them as a whole. Before we get to that I will just sketch a day's work. Rise half an hour before daylight, light your fire and prepare soft food, cart it around and feed your stock, and open doors and windows, have breakfast, clean out your fowlhouses, see the drinking fountains are clean, and the birds have stones and bones, cut your green feed, chaff it up, and water the plot where it was cut. Dinner; take around green feed, and note which birds are laying. Hour's spell. Take around last feed, and collect eggs, boil the meat for morning use, and pack eggs. On two days a week you must average your work to have time to run into town, sell your produce, and return with meat, bones, grain, bran, and pollard. This work has to go on every day, either yourself or hired labour. And now for the prices to get for eggs. The last two years are exceptional, and I do not possibly believe you can count on more than an average of 9d. per dozen.

I have put down the fowls to lay 132 eggs each per annum, and in so big a flock this is not any too low. I believe I could work up to a higher average by careful breeding and selection, and it is in this direction the profits will be. Writers on poultry all tell of the great profits to be made, but I notice they do not go in for it themselves. The great future before the poultry industry is with the farmers and others who can devote a little more time and attention to their individual flocks. There is room there for great improvement, and a man who has a family can relegate the daily routine to one of them, and give a general supervision to the whole. The whole object in this paper is to clearly set out the industry from a hard business point of view, and not from any wish to decry it, and any one can draw his own conclusions from my figures. The man who keeps a few fowls and has scraps from the house to help feed them, and looks after them in his spare time as a recreation is on a totally different footing to one who makes it his business. Gardening as an amusement is a healthy, enjoyable recreation, but the market gardener does not take quite the same view of his life. I have heard him call it hard, bad paying, and wearisome toil. Whether the poultry farmer's is the same I cannot say, as I know of none who have gone in for it solely and made a success of it. The reason I think is that many people who do go in for it and fail do so without carefully considering the cost. Those who do consider this and know of the risks and ties involved put their money into something which gives a better return for the capital required.

BALANCE SHEET, ONE YEAR.

Dr.	£	s.	d.	Cr.	£	s.	d.
To 360 bushels wheat, at 3s	54	0	0	By 8,800 dozen eggs, at 9d	330	0	0
300 bushels oats, at 2s	30	0	0	400 young birds, at 1s 9d	35	0	0
250 bushels barley, at 2s	25	0	0	400 old hens, at 1s	20	0	0
200 bushels pollard, at 9d	7	10	0				
1 ton green bones	2	10	0				
Shell and grit	1	0	0				
Extra food for fattening	10	0	0				
Liver or meat	20	0	0				
	£150	0	0				
Rent of land, with house	50	0	0				
Interest on capital (£600) at 5 per cent	30	0	0				
Depreciation and renewals at 4 per cent	24	0	0				
Kerosine and fire	6	0	0				
Medicines and tonics	2	0	0				
	£262	0	0				
Balance profit	123	0	0				
	£385	0	0		£385	0	0

My food bill works out slightly under 1d per hen per week and I do not think it possible to keep them under that. Of course if I can raise my egg production above the 132 eggs per bird per annum it is all clear profit, but, on the other hand, I have not allowed any loss for deaths or unforseen catastrophes, but personally I do not think the returns adequate for the capital needed and the attention required.

CAPITAL ACCOUNT

	£	s.	d.
Eight houses, each 20 x 17, sub-divided into four, with wire-netting with door, window, perches and asphalt floor, at 18s each	144	0	0
Two and a half miles of wire-netting, at 35s per mile	87	10	0
Plain and building wire	10	0	0
Thirty-five yard gates at 5s	8	15	0
Posts or standards	7	10	0
Water piping, standards and taps	62	0	0
Lime, kerosine, and incidental	5	0	0
	£324	15	0
Incubator house, breeders' pens and yards, and chick runs and houses	100	0	0
Chaffcutter, grainmill, bonemill, boiler, and utensils	15	0	0
Incubators and foster mothers	30	0	0
Wheelbarrow, brooms, shovels, and small tools	5	0	0
Horse and cart	25	0	0
Stock	25	0	0
Feed till returns commence	15	0	0
Living	25	0	0
	£564	15	0

ROSEWORTHY AGRICULTURAL COLLEGE NOTES.

EXPERIMENTAL VINEYARD.

By H. E. LAFFER, SUPERINTENDENT OF VINEYARD.

In connection with the vineyard all seasonable work has been pushed on as rapidly as possible. The ploughing was started as soon as the soil would allow, and the ploughs have had to be stopped very little. The light rainfall has just kept the soil sufficiently moist to turn over well.

Notwithstanding the summer rains recorded in the early months of the year, our total up to date is about three inches short of what it was last year. This deficiency, we hope, will be made up in the succeeding months. There is very little growth of weeds on the land, owing to the late rains and cold weather. In May several severe frosts were experienced; but, taken on the whole, the weather has been mild.

An early start was made with the vine-pruning, and this operation is now well in hand.

Young fruit trees have been planted in the places of those which failed last year. All the young orchard planted last year has been subsoiled recently to a depth of fifteen inches. This should have a marked influence on the growth of the trees.

Some of the oldest vines were too closely planted. The alternate rows of these have been taken up and the centre strips to a width of five feet have been subsoiled. As we have records of yields for several years past, we shall be able to compare them with those of the future. At any rate, we expect to get quite as much fruit from the plot with only half the number of vines.

We have again demonstrated the utility of the vine hoe, by the rapidity with which the strips left in ploughing can be removed from the rows.

The usual manures have been applied to the test plots of vines and many of the others have received the usual dressing of superphosphate. In the test of manuring in the centre of the rows *versus* directly around the stems, there was no difference in the result last season. As no conclusion can be formed on the result of one season, it is intended to carry this on for several years.

AGRICULTURAL EXPERIMENTS.

ROTATION OF CROPS.

By ARTHUR J. PERKINS, SECRETARY FOR AGRICULTURE.

The following is a copy of a letter addressed to Mr. N. Brookman, of Glenthorne, O'Halloran Hill. My reasons for publishing this letter are:—(1) It gives some indication of my views on the question of the possibilities of crop rotation in the later districts; and (2) if we are to make any definite advance in our farming practices we must undertake a series of experiments over a number of years on the same area of land, and keep careful records of the costs and returns from the different plots. I hope in a future issue to discuss in detail this question of crop rotation:—

"Your note to hand. The area we shall require for experimental purposes will depend largely on what we determine to do. I am inclined to think that it will develop as we go along. The main point to be borne in mind is that if the experiments are to be of any value the plots must be *permanent*. On the whole, I think acre plots should give satisfactory results. It is of no use making them too large, because of the amount of labour they are bound to absorb.

"The nature of the work will depend on the points we wish to elucidate. Now, to my mind, the following is an important point, and one I think worthy of testing. From the results of our experiments you will be able largely to guide the practice of your whole farm. The point I refer to is the following:—How to turn to best advantage in mixed farming agricultural land of average quality with a fair rainfall. Now, to my mind, this can only be done by combining the feeding of stock with the growing of crops. This implies the rotation of crops in which forage crops must play a large part. It will be our object to ascertain what is the most suitable combination. I shall map out my ideas fairly fully, so that you may have them on record and think them over.

"I propose that we take as the basis of our work the Norfolk four-course rotation, as I know of none other that is more rational, and adapts itself better to the object we have in view. This rotation is, as you, no doubt, know:—1. Turnips. 2. Barley. 3. Red Clover. 4. Wheat. Now, we are by no means bound to the special crops above named, but I think we should endeavour to adhere to their arrangement, and for the following reasons:—The root crop at the head of the rotation should receive specially deep tillage; we might in some cases test subsoiling; the effect of this deep tillage will be felt throughout the rotation, and will, in my opinion, benefit the wheat, which requires, of course, shallower tillage in the year immediately preceding it. I do not think that wheat will follow a root crop to best advantage, as the soil will be loose and open; consequently barley, which can be fed to pigs, or even sheep, will follow better in the second year. The insertion of a leguminous crop in the third year before wheat is in accordance with the best practice. And finally comes wheat, which should benefit in yield to a considerable extent by the cropping of preceding years. The root crop should receive the farmyard manure of the farm, so that in ordinary practice one quarter of the farm would be manured yearly.

"Now, as to what we should do. We require a series of four acre plots, separated by two acre plots, on which the ordinary practice of wheat and bare fallow will be adhered to, with perhaps a couple of plots carrying wheat continuously. I propose the following series as worthy of consideration:—

"1. Mangels, barley, pease, wheat.
"2. Mangels, oats, pease, wheat.
"3. Mangels, barley, beans, wheat.
"4. Kale, barley, beans, wheat.

"In addition to the above, catch crops consisting, perhaps, of rape and crimson clover, should be sown in the autumn on the stubbles, and either fed or ploughed in.

"You will notice that I have not included red clover, mainly because I did not want to frighten you too much at the start, and because I have not much confidence in its future here. We may test it, nevertheless, if you care to.

"But the growing of crops is not all. Careful record will need to be kept of all expenditure that would be necessary in the course of ordinary cultivation. It will be necessary to distinguish between expense that is inseparable from exact experimental work and that which characterises ordinary work. The number of stock to which the crops that are fed correspond will also need to be carefully calculated, so as to establish a profit and loss account for the various rotation plots by comparison with the plots under wheat and bare fallow only.

"I think the above will form quite enough to begin with. The main items of expenditure will be represented by cost of keeping plots clean, and facilities for folding sheep on them when necessary."

In connection with this question of *permanent experiments* it might be mentioned that the Department has this year arranged with Messrs. F. Coleman, of Saddleworth; P. A. Cockburn, of Strathalbyn; T. Pengilly, of Aldinga; and C. Domaschenz, of Yorketown, to set apart small areas on which experiments will be carried on for a number of years. The first two will be confined to continuous tests with phosphates, nitrogen, and potash, separately and combined, as applied to the growing of grain; the Yorketown plots deal with the utilisation of "salt patches" for cereals and fodder crops, while at Aldinga fallow crops for fodder, instead of bare fallow, as a preparation for cereal cropping, will form the basis of the experiments.

ALLEGED POISONOUS PLANTS.

Considerable difference of opinion exists amongst stockmen and graziers as to the qualities and properties of a number of Australian plants. Frequent cases of losses of horses, cattle, and sheep have apparently been traced to plants which, on the other hand, are known to be eaten by stock with relish, and without any injurious results. Amongst these, probably Euphorbia Drummondii takes first place, from the numerous deaths attributed to it, yet we have it on record that sheep were fed on it for several weeks in New South Wales, and did well on it. Then we have Lotus australis, the pea-flowered plant known in different localities by such contradictory names as "native lucerne" and "poison plant." The variety Lotus Behrii might also be mentioned in this connection. In addition, there are such plants as Swainsonia sp., Pimelia sp., Dodonea sp., Gastrolobium, Myoporum, Solanum, and others. These all come under the description of "alleged poisonous plants." Reference has been made on previous occasions to the poisonous nature of immature sorghum and to the fact that prussic acid has been detected in this plant and in species of Lotus.

A number of stockmen hold the opinion that Lotus australis and Euphorbia Drummondii are only poisonous at certain states. Of the former it is sometimes said it is harmless except when in seed.' The 1903 issue of the Imperial Institute Bulletin contains reports of recent research into the poisonous character of certain fodders, which have an interesting bearing on this subject. Referring to sorghum, it states that the Arabs have for many years been aware of the poisonous nature of the immature plant and that in consequence the fields in which it is cultivated are kept enclosed until the plant is ripe, when stock are allowed to browse on it. In Lotus arabicus, a kind of vetch indigenous to Egypt, and in Lotus australis, it has been proved beyond question that when the young plant is crushed and moistened with water prussic acid is formed, but in the mature plant it cannot be traced. The Arabs are aware that L. arabicus becomes innocuous when the seeds are ripe, and use it then as a fodder. It would seem, therefore, that some at least of our reputed poisonous plants are only injurious in their young stage. The observations of stockowners on this point would be of considerable interest.

The Imperial Institute Bulletin, in dealing with this matter, states that it must be understood that in the instances investigated the poison does not exist as such in the plant, but is formed as the result of a chemical action induced between two constituents of a plant when these are brought into contact with each other by crushing and the addition of water.

NOTES FOR PREPARING CARCASE PORK, VEAL, AND DRESSED POULTRY FOR MARKET.

By JOHN W. SANDFORD, ADELAIDE.

[The following notes have been submitted by Mr. Sandford, in response to request of some of our readers.—ED.]

In preparing Carcase Pork and Veal for market, farmers would do well to give extra attention to properly slaughtering and dressing of the carcase, as condition and appearance are almost as great factors as that of the quality of the meat, for if slaughtered in a tradesmanlike manner it will well repay the farmer for his trouble. Where, however, with pigs the skin has been almost boiled in the scalding and the carcase stained through improper draining, it can readily be understood that such suffers in value. The weights that are preferred for shop purposes range from 60 to 90 lb., these invariably realize top figures, but from 110 to 125 lb. is considered of bacon size. Anything much in excess of this then becomes classed as heavy weights or choppers. **Vealers.**—The Adelaide market has been bare of prime stuff for some considerable time, therefore good rates have ruled. In preparing these for sale the hide is not taken off, as they carry much better when this is left on. It is unwise to forward with the pluck in, and buyers are also willing to pay better prices if the carcase is minus the head and feet. This can be understood, for at the end of a journey the hair becomes so set that the head, etc., is practically useless for shop purposes, besides only adding extra cost to freightage.

In dressing Poultry for market farmers will find it much easier to get the feathers off completely if the bird is plucked immediately after killing; that is, whilst it is warm, for not only will the feathers readily come away, but there is less likelihood of tearing the skin. The birds should then be hung up until set and animal heat allowed to thoroughly escape. In trussing, the neck should be cut off short, in a line with the shoulders, the skin being slit on the back and allowed to fall over in the front, when the crop can be taken readily out. After this the loose skin is then put back in original position, *i.e.*, over the butt of the neck, the point of the wings being fixed upon this so as to keep it in place. The drawing process should then be completed. In trussing the birds, farmers will find it better to use an ordinary butcher's skewer, about ten inches long, which should be pierced through the back muscle of the wing, between the body and the first joint; then through the muscle of the thigh, along the top of the shoulder, and pierced through the thigh on the other side, also catching the muscle of the opposite wing. Each of the legs can be looped and a double string passed over the back. This will hold the bird well in position for market purposes.

FARM AND DAIRY PRODUCE MARKETS REVIEW.

Messrs. A. W. Sandford & Co. report on July 1, 1904:—

Since our former, the usual winter conditions have prevailed, although in the Northern Areas more rain was wanted, but towards the close of the month a couple of very useful falls have been reported, so that in this direction farmers are now better satisfied. There are glowing accounts from the pastoral districts of this season being one of the most favourable for many years.

In Commerce, the houses mostly report trade being very much on the slow side, but this is to be expected considering the time of the year. However, with a favourable season ahead, prospects generally are most assuring. At Broken Hill the big mine continues to furnish good returns. In Metals, Silver shows a firming, whilst Lead has recovered the easing, and Copper appears to have held its own.

Breadstuffs.—The decline in the market for U.K. cargoes of Wheat, mentioned in our last, continued, and past week sales were reported at 28s. 6d., but at the time of writing an improvement is noticeable, and for August-September shipment sales have been made up to 29s. 6d. for 480 lb. Private London advices per mail state wheat continues to pour in from Russia, India, and the Argentine in very large quantities. The new Indian crop is said to be of especially fine quality, and in the face of the large output of that country it is pressed for sale at relatively low prices. Locally Wheat has been selling in the three southern States at about 3s. per bushel, but the amount of business put through has not been by any means large. Farmers generally are not anxious sellers, but should the very useful showers we are now receiving be followed by more, Wheat will no doubt be marketed more freely. Flour.—The London millers state that they are now making such good quality that importers find it hard to compete, consequently the demand for Australian make has eased, and the price now offered by U.K. buyers will not leave £7 per ton net f.o.b. here. Forage.—Farmers are none too anxious to quit their Hay at present low quotations, but on the other hand chaffcutters find business dull, the demand being only for local requirements, although a few small parcels of specially prime samples found buyers for Sydney. Millers' Offal.—Pollard has had a very slow sale, but there has been a good demand for Bran at slightly advanced prices. In Feeding Grains the market is almost stagnant, with no quotable alteration to report. Cape Barley.—There is very little offering, and the call is almost nil.

Potatoes.—Mount Gambier growers are passing through a very trying time, for, whilst the quality and yield are quite up to that of average seasons, the exceptionally low prices ruling throughout the Commonwealth prevent growers who are situated a distance from the railway from being able to dig, bag, and cart, so as to cover cost at the prices quoted, even if the potatoes were given in. Meanwhile the tubers nearer the line are supplying the demand; but £1 per ton, railway station, bags in, leaves these growers but very little return for their labour. Onions.—It was expected that the local grown would have cut out by this time, but they are still in sufficient supply to keep the city market filled, so that there have only been a few odd parcels of "Gambiers" brought along.

Dairy Produce.—During the first half of the month the extra requirements in Butter were supplied from Victoria and New South Wales, an occasional parcel from Queensland, but with quantities of South Australian fresh in prints having rapidly increased, our State may now be termed self-supplying in this direction. Given a continuance of these present favourable conditions, within a very brief period a surplus will be available, and as these new Butters will be the earliest on the markets, Western Australia and Broken Hill should keep us clear for some time. In Bulk Butter, the eastern States have been anxious to unload at reduced rates rather than send on to the old country, but the call for this dwindled to such an extent that importers have been forced to cold store, in hopes of some other outlet offering. Eggs.—The fluctuations in values this winter have been unprecedented, and although at times the supplies displayed a tendency to shrink, any advance in value was immediately checked for the new laid, under the influence of the heavy parcels of refrigerated and preserved offering, owners of same being now eager to sell, therefore prices for the fresh have come back nearly 4d per dozen. Cheese.—Although the consignments now being marketed are none too heavy, most of these show signs of age, so that for such there is no improvement in price to report, but newer or later makes are commanding good trade. Bacon has met with dull sale. This is to be expected in midwinter, but with values persistently drooping, curers are feeling it all the more acutely, as most of their stocks had been put in when the live hog sold at higher rates. Trade in Hams has been almost stagnant, buyers preferring not to stock, even at the exceptionally low rates. Honey is having better enquiry, but this applies only to prime clear extracted samples; dull or candied lots have met with only dragging sale. Almonds have had good business at about former quotations.

Carcase Meat.—There is the usual winter demand for pork, and satisfactory prices have ruled throughout June for all prime stuff coming forward. Bright, handy-sized shop porkers, weighing from 60 to 90 lb., realise best prices; that is, where they have been well slaughtered; but heavy choppers and rough sorts suffer in value according to condition. Veal.—Supplies have been rather short in this line, resulting in good rates being secured for well-fed and conditioned carcases, buyers preferring to pay extra for vealers that have been forwarded minus the head and feet. There is a nice market for Dressed Poultry at full rates.

In Live Poultry, farmers would do well not to hold on to their birds until they can be only classed as aged or poor sorts, for during the month highly satisfactory prices have been secured for all coops of prime conditioned, but the usual difficulty is experienced in finding buyers for weedy or light stuff even at low figures.

Market Quotations of the Day.

Wheat.—At Port Adelaide, shipping parcels, 2/11 to 3/ per bushel of 60 lb.

Flour.—City brands, £7/5/- to £7/10/; country, £6/15- to £7.

Bran.—7½d. to 7¾d.; Pollard, 7½d. to 7¾d. per bushel of 20 lb.

Oats.—Local Algerian and Dun, 1/4 to 1/6; White Champions, 1/8 to 1/9 per bushel, 40 lb.

Barley.—Cape, 1/10 per bushel, 50 lb.

Chaff.—£2/15/- per ton of 2,240 lb., f.o.b. Port Adelaide.

Potatoes—Gambiers, £2/2/6 to £2/5/- per 2,240 lb., f.o.b. Port Adelaide.

Onions.—Locals and Gambiers, £3 to £3/7/6 per 2,240 lb.

Butter.—Factory, creamery, and choice separators, 9½d. to 11½d.; best dairies and ordinary separators, 8½d. to 9½d.; well-graded store lines, 7½d. to 8d.; mixed to ordinary, 7d.

CHEESE —Factory make 5½d to 6d per lb aged and dry lots, 4½d to 5d

BACON —Factory cured sides, 6½d. to 6¾d farm flitches, 5½d to 6½d per lb.

HAMS —S A. factory, 8d to 9d per lb

EGGS —Loose, 1/0½ in casks, f.o b , 1/2 per dozen

LARD —In bladders, 4½d tins, 4d per lb

HONEY —2½d prime clear extracted, in 60-lb tins, discoloured and candied, down to 2d , beeswax, 11½d per lb

ALMONDS —Softshells, 4d to 4½d kernels, 8½d per lb

CARCASE MEAT —Bright handy-weight shop porkers, 4½d to 5d medium baconers, 3½d to 4d , choppers, 1½d to 2½d prime dairy veal, 3½d to 4½d , medium sorts, 2½d to 3d

DRESSED POULTRY — Turkeys, 5½d to 6½d per lb , fowls, 4½d to 5½d per lb

LIVE POULTRY —Heavy-weight table roosters, 1/8 to 2/ each good-conditioned hens and fair cockerels, 1/- to 1/6 poor and light, 8d to 10d , ducks 1/6 to 2/6 geese, 3/- to 4/ pigeons, 5½d turkeys, 4d to 5d per lb live weight, for fair to good table birds

Above quotations unless when otherwise specified are duty paid values on imported lines Grain Flour, and Forage for export are f o b prices at Port Adelaide Dairy products are City Auction Mart rates In Grain, Chaff and Potatoes sacks are included, but weighed as produce Packages free with bulk Butter and Cheese

COUNCIL OF AGRICULTURE.

The June meeting of the Council of Agriculture was held at Roseworthy College on the 8th inst , there being present the Chairman (Mr R Caldwell), Col Rowell, C B , Messrs A Molineux, J W Sandford B Basedow J Miller, H V Pridmore, T E Yelland, and G R Laffer

The morning was spent in inspecting the sugar gums along the main drive, the wine cellars, poultry, machinery, etc In the afternoon the usual meeting of the Council was held

The Hon Minister intimated that he intended to ask Col Rowell and Messrs G R Laffer and T B Robson to act as a committee to assist Mr Holtze in determining the commercial value of the new varieties of fruit at Mylor Typical Orchard Mr Laffer thought it was a pity that the splendid collection of citrus fruits, apricots, and peaches which Mr Holtze had gathered together were not in a locality suitable to the proper development of such fruits, Mylor being too cold and wet

The Minister forwarded report from Professor Perkins on the Council's recommendation that the Roseworthy scholarship examinations should be simplified in order to afford the sons of farmers a reasonable chance of securing them. Professor Perkins was in favour of some alteration, and would make English and mathematics the main tests, and omit the examinations on agriculture in the competition for the scholarships The Hon Minister intimated that consideration of this matter would be deferred until the appointment of the new Principal of the College

The Hon Minister notified the Council of the resignation of Professor Towar, and that, pending the appointment of a new Principal, Professor Perkins would, so far as his other duties permit, supervise the work at the College and the management of the farm. The Minister also intimated that, on the recommendation of Professor Perkins, the position of Principal of the College had been offered to Mr. W. J Colebatch, B Sc M R C V S , formerly a Roseworthy student, and now lecturer at Lincoln (New Zealand)

Agricultural College. [We regret to say that Mr. Colebatch is unable to accept the position offered.—Ed.].

By request of the Council, Mr. Quinn gave his views in respect to the proposal to remove the sugar gums from either side of the main drive. In his opinion, it was a pity these trees were planted on this dry, limestone ridge, as the position was not suitable. His idea was to remove the gums, many of which were unsightly, and improve the sweep of the drive, planting Aleppo pines on either side, with olives replacing the almond and other trees that were also failing. On the motion of Mr. Yelland, the Council adopted the recommendation of the College Committee that the gums should be removed and replaced by more suitable trees.

The Hon. Minister returned resolution *re* destruction of sparrows and starlings, with request for a practical suggestion for dealing with these pests Mr. Pridmore stated that, as this matter was still under consideration by the Royal Agricultural Society and the Vinegrowers' Association, he was not just then prepared to move further in the matter. What would probably be suggested was that the Government should subsidise amounts collected by the members of the two Societies, in order to offer substantial rewards during the breeding season for the heads of the birds. Offering money for the eggs was not effective, as some enterprising youths had found out that if the eggs were removed from time to time and the nests left undisturbed the birds would continue to lay. In one instance he knew of 4,000 sparrow eggs being obtained in one season on a small estate near Adelaide, and up to 30 eggs had been obtained from a single nest during the season. A good price for heads during the breeding season should, however, have a marked effect on the numbers of the birds.

The College Committee recommended that the Council should urge upon the Minister the desirableness, in connection with the appointment of a successor to Professor Towar, of making the officer Principal of the Agricultural College, and not also Professor of Agriculture, in order that there should be no misunderstanding as to the main duties of the officer. Some discussion ensued, Mr. Miller opposing the suggestion, as it would mean that the Principal would not be able to visit country districts and give lectures. The farmers would be deprived of the benefit of the Professor's services. Mr. Yelland, in moving the resolution, which was carried, pointed out that it was not intended that the Principal's time should be confined solely to the College, but there should be no doubt that his main duties consisted in the education of the students at the College, the management of the farm, and the supervision of experimental work. During vacations and at other times when his work permitted he would be at liberty to visit various parts of the State.

On the motion of Mr. Miller, it was decided to ask the Hon. Minister to purchase the appliances required to place the small wheat-testing mill in working order.

The Bureau Committee reported receipt of resolution from Inkerman Branch, asking the Council to oppose the proposal emanating from New South Wales that legislation should be enacted throughout the States to prohibit the use of anything larger than a three-bushel grain sack. The committee did not consider it necessary to deal with the matter at present, as there was no immediate prospect of any action being taken by the South Australian Legislature.

The following gentlemen were approved as members of the undermentioned Branches:—Messrs. A. Kerber and D. Murphy, Woodside; E. Fuller, Koolunga; E. T. Barnes, Denial Bay; A. McCallum, jun., Caltowie; J. T. Baldwin, Gawler River; J. G. Williams, Watervale; M. Leonard, F. Gillings, J. Carn, and E. McGowan, Boothby; G. Goldner, Woolundunga; P. McNamara, Wepowie; D. Whyte and C. Martin, Morchard; D. Black and F. Hodge, Narridy; G. Haines, Mundoora; F. Formby, Kanmantoo, A. Marshman. Mallala.

Mr. Sandford drew attention to the fact that large quantities of veal and pork sent to the Adelaide market were damaged by bad slaughtering and dressing. As the College stockman was competent to give the students instruction in slaughtering and dressing pigs, sheep, and calves, the advisableness of taking that course should be referred to the College Committee for consideration. A motion to that effect was carried.

Mr. Yelland suggested that the Council should ask the Minister to again approach the Victorian Government with a view to secure a modification of the present unnecessarily severe restrictions on the importation of poultry. In reply to a question, Mr. Summers stated that the only occasion recently on which the Department had communicated with the Victorian Government in this connection was concerning the fowls intended for the Dookie egg-laying competition, when the Department of Agriculture in the sister State declined to modify the regulations.

A meeting of the Council was held on Wednesday, June 29, there being present—Mr. R. Caldwell (Chairman), Col. Rowell, C.B., Messrs. F. Krichauff, J. W. Sandford, G. R. Laffer, H. V. Pridmore, A. M. Dawkins, J. Miller, T. E. Yelland, and R. Marshall.

Mr. Dawkins referred to statement made at previous meeting by the Chairman that Professor Towar was a competent man. This was a distinct reflection on the Board of Enquiry which had reported to the contrary, and he wished to know whether the Chairman's remarks were endorsed by the Council. Some discussion on the subject took place, and it was pointed out that Mr. Caldwell's remark was purely a personal opinion, and that the Council could express no opinion on the report of the Board, as it had not been before them.

Mr. Marshall moved:—"That, in the opinion of this Council, the time has arrived when the Government should start experimental wheat culture, with a view to improving the milling and commercial value of South Australian wheats, by a system of cross-fertilisation, or by any other desirable methods; that the Government should also assist private experimentalists in cross-fertilisation of wheats, with a milling test, free of charge, for all new wheats thus made; and that the results of all such tests be published in *The Journal of Agriculture*." As a charge for testing samples of wheat was apparently contemplated, he had confined the scope of the resolution to samples of wheat made by cross-fertilisation, because the milling value of the wheats commonly grown was pretty well known, and because mere selections were not likely to give any better results in the future than in the past, from a milling point of view. The strong flour wheats were confined to two types, the Fife and Bluestem, and were suited to cold climates with a longer growing season than was possessed by South Australia. Even if these wheats were otherwise suitable, it would be undesirable to bring them into cultivation here, because Australian wheats were known in the world's markets as white wheats, and were sought after as such. It had been proved in New South Wales that the strong flour wheats could be used with great advantage in cross-fertilisation with early wheats of the Australian type. By working on those lines, and adopting a good methodical system of working, with a test to prove the milling value of such wheats, the Agricultural Department of New South Wales had become possessed of several new wheats of very high milling value, some equal in strength, and a few superior, to the strong flour wheats of America. Those wheats do not differ much in appearance from the wheats generally grown in Australia. They also make flour of excellent colour. Mr. Farrer, the wheat experimentalist of that State, had succeeded in producing several new varieties, which promised very shortly to take the places of old and weaker kinds. The value of one named "Bobs" would be apparent from the fact that from a sack of flour made from this wheat no fewer than eleven more loaves could be made than from the flour of the old Purple Straw; and from the flour of another new wheat named "Jonathan" twelve more loaves of bread could be made than from a sack of Purple Straw. Those were crossbred wheats now known as Fife-Indian wheats and had been made by crossing the strong flour American wheats with early Indian wheats. The grain of the Indian wheats was like the Australian wheats in appearance, but produced much less straw. South Australian farmers prided themselves on being able to produce the best wheat in the world, but of late years a great revolution had taken place in the milling industry, and in determining the food value of various wheats. Other wheats have a greater intrinsic value, but he believed they possessed conditions equal to the best in the world for growing high-class wheats. There was no other method whereby they could secure such wheats except by a system of cross-breeding between the well-known flour wheats and early varieties. It was also very necessary that milling tests should be made to determine the value of these new wheats, as without them much valuable time and labour would be lost. The wheat plant varied in the amount of resistance it offered to rust; but, as they all knew, it was capable of being improved in that quality. It was not so many years since the idea of rust-resisting wheats was considered out of the question and impossible. Their own work in South Australia had resulted in a number of varieties which resisted rust, and matured their grain in very rusty seasons without injury. There were doubtless many difficult problems in the work of improvement, which must be rather slow. He regarded the question as a national one, and altogether beyond the scope of private enterprise, and it demanded at the hands of the State the most earnest, constant, and complete attention. The chief points to be borne in mind were:—The wheats that would yield the greatest profits per acre for the farmer, and supply the mills with wheat of superior quality, and be the most nourishing and valuable as human food. If they succeeded in raising the commercial value of their wheat one penny per bushel, and took their surplus, after supplying seed, at fourteen million bushels, it would represent an increased value of £58,333 per annum.

Some discussion ensued, and Mr. Marshall's motion was carried unanimously.

The Chairman read draft of annual report, which, with certain alterations, was adopted.

ADVERTISING SOUTH AUSTRALIAN FRUIT.

The Hon. Minister of Agriculture has received from the Agent-General in London particulars concerning a show of colonial grown fresh and preserved fruits, to be held under the auspices of the Royal Horticultural Society of England on December 13 and 14. There will, of course, be no opportunity for our growers to exhibit fresh fruits, but dried fruits, bottled fruits, and jams could be supplied. The Secretary of the Society states that the Society's officials will unpack and stage exhibits; that no charge will be made for space; and that opportunity will be given to each State to make a collective exhibit in addition to individual exhibits. Arrangements will also be made for a public lecture on fruitgrowing in South Australia if the Agent-General can recommend a suitable gentleman prepared to undertake the duty.

In view of the necessity for seeking outside markets for our products it is hoped that some of our growers will endeavour to arrange to be represented at this show. The Department of Agriculture will afford intending exhibitors any assistance possible.

"JOURNAL OF AGRICULTURE."

From January 1, 1904, the "Journal of Agriculture" will be posted to anyone resident in South Australia bona fide engaged in the cultivation of the soil on payment of a REGISTRATION FEE of One Shilling per annum. Single copies will be supplied at 3d. each; back issues at 2s. 6d. per doz. The indexes of Vols. I. to VI. can be obtained by members of the Agricultural Bureau and subscribers desirous of binding their volumes.

MONTHLY RAINFALL.

The following table shows the rainfall for the month of June, 1904:—

Adelaide	3·92	Manoora	1·80	Echunga	3·99
Hawker	1·27	Hoyleton	2·09	Macclesfield	3·49
Cradock	0·80	Balaklava	2·00	Meadows	4·16
Wilson	1·18	Port Wakefield	1·96	Strathalbyn	2·14
Gordon	0·91	Saddleworth	1·83	Callington	2·55
Quorn	1·44	Marrabel	1·98	Langhorne's Bridge	2·09
Port Augusta	0·99	Riverton	2·24	Milang	2·52
Port Germein	1·80	Tarlee	1·88	Wallaroo	2·42
Port Pirie	1·57	Stockport	2·15	Kadina	2·32
Crystal Brook	2·06	Hamley Bridge	2·42	Moonta	2·48
Port Broughton	2·30	Kapunda	2·49	Green's Plains	2·90
Bute	2·84	Freeling	2·61	Maitland	3·59
Hammond	0·88	Stockwell	3·01	Ardrossan	3·08
Bruce	0·72	Nuriootpa	3·23	Port Victoria	2·92
Wilmington	2·04	Angaston	3·40	Curramulka	4·52
Melrose	2·48	Tanunda	3·19	Minlaton	3 65
Booleroo Centre	2·25	Lyndoch	4·08	Stansbury	3·23
Wirrabara	2·52	Mallala	3·16	Warooka	3·50
Appila	1·50	Roseworthy	2·55	Yorketown	3·19
Laura	2·02	Gawler	3·47	Edithburg	3·17
Caltowie	1·80	Smithfield	2·92	Fowler's Bay	3·94
Jamestown	1·86	Two Wells	2·95	Streaky Bay	3·11
Gladstone	1·81	Virginia	2·77	Port Elliston	4·70
Georgetown	2·46	Salisbury	3·25	Port Lincoln	3·57
Narridy	1·98	Tea Tree Gully	5·25	Cowell	1·78
Redhill	1·87	Magill	4·88	Queenscliffe	2·55
Koolunga	1·77	Mitcham	4·81	Port Elliot	3·81
Carrieton	0·84	Crafers	8·65	Goolwa	3·00
Eurelia	0·98	Clarendon	7·00	Meningie	2·97
Johnsburg	0·42	Morphett Vale	3·50	Kingston	2·18
Orroroo	1·02	Noarlunga	3·59	Robe	5·02
Black Rock	1·12	Willunga	4·92	Beachport	4·50
Petersburg	1·09	Aldinga	4·96	Coonalpyn	1 60
Yongala	1·14	Normanville	6·60	Bordertown	1·75
Terowie	1·15	Yankalilla	7·78	Frances	1·47
Yarcowie	1·02	Eudunda	1·96	Naracoorte	1·84
Hallett	1·37	Truro	3·01	Lucindale	1·78
Mt. Bryan	1·70	Palmer	1·99	Penola	2·10
Burra	1·44	Mount Pleasant	3 97	Millicent	3·68
Snowtown	2·29	Blumberg	5·41	Mount Gambier	2·97
Brinkworth	2·17	Gumeracha	6·03	Wellington	1·77
Blyth	2·22	Lobethal	7·33	Murray Bridge	2·23
Clare	3·14	Woodside	4·97	Mannum	1·63
Mintaro Central	2·74	Hahndorf	4·62	Morgan	1·02
Watervale	3·34	Nairne	3 56	Overland Corner	0·94
Auburn	2·61	Mount Barker	4·53	Renmark	1·00

AGRICULTURAL BUREAU REPORTS.

Booleroo Centre, May 24.

PRESENT—Messrs. Brooks (chair), Kelly, Nottle, Repper, Arthur, Michael, Steven, Albinus, and McMartin (Hon. Sec.), and two visitors.

ANALYSIS OF SOILS.—The Chairman read a paper on the value of analysis of soils as a guide to the manuring of land. Thousands of tons of manures were used annually by farmers, who had no idea of what their lands were deficient in. Soils in each district varied; in fact, on every farm there was a considerable diversity of soils, and it was only natural that the manure which suited one would not suit the others. They had examples of this in their own district, where the land could be generally divided into three sections, viz., the red soil, the brown, and the white. Superphosphate gave good results on the two former, but not on the latter. He considered that, in view of the importance of this matter, the Government should provide for cheap analyses of soils. Dr. Steven strongly supported, but Mr. Nottle thought it would be difficult for any one to determine from an analysis of the soil which manure should be applied, as the soil on every farm varied considerably. Mr. Kelly was satisfied that the white land was deficient in vegetable matter, and that it would benefit by the application of stable manure. [The Department has already arranged for cheap analyses, viz., 3s. for each determination required. It is impossible to reduce this charge unless Parliament votes a special sum of money for this purpose.—ED.]

Port Pirie, May 28.

PRESENT—Messrs. Wright (chair), Bell, Teague, Johns, Jose, Morrish, Crispin, Hector, Spain, and Wilson (Hon. Sec.), and one visitor.

FORMALIN.—The Hon. Secretary, in reply to a question, stated that some farmers he knew who were trying formalin as a pickle for wheat experienced no difficulty in drying the grain.

STANDARD BUSHEL.—Proposal of Kapunda Branch that a petition asking for legislation to compel the adoption of the imperial bushel of 60 lb. as the standard for wheat was discussed. Considerable difference of opinion existed on the subject, and it was decided to suggest that the matter be brought forward at the September Congress. Some members, while dissatisfied with the present system, did not think the Kapunda proposal would be an efficient remedy, while its operation would tend to lower the quality of South Australian wheats.

Onetree Hill, May 25.

PRESENT—Messrs. J. Bowman (chair), G. and F. Bowman, Blackham, Blake, Cowan Ifould, W. and E. A. Kelly, Smith, Thomas, and Clucas (Hon. Sec.).

BEEKEEPING.—In reply to questions, Mr. F. Bowman gave some further information on beekeeping. He thought the quantity of water required by bees would come as a surprise to most people. He found bluegum honey candied very quickly, and while it could be reduced to liquid form by steaming, it soon granulated again.

HORSE-SHOEING.—Paper read at Lyndoch Branch was discussed with much interest.

DAIRYING.—Members who had considerable experience in dairying, and had given close attention to the feeding of their cows, were somewhat surprised at the statement of Mr. Folland, of Reeves Plains Branch, that he had obtained an average of 8 lb. of butter per cow per week when feeding on sorghum. Maize was regarded as decidedly superior as a fodder, though sorghum was hardier.

PIG-BREEDING.—Some discussion followed the reading of an article from the New South Wales *Agricultural Gazette* on this subject.

Watervale, May 27.

Present—Messrs. Birks (chair), Kelly, Christison, Knappstein, McCarthy, Dall, and Greenway (Hon. Sec.)

Membership.—Suggestions from Wilmington Branch were discussed at length, and an amendment that the Department be asked to increase the limit of membership to twenty-five was carried unanimously.

Protection of Haystacks.—Mr. W. S. Birks read a paper on protection of haystacks from weather and mice. The amount of hay that is wasted on many farms through exposure to the weather and the ravages of mice is more than sufficient each year to pay the interest on outlay for the necessary covering, and in a very few years would pay the entire cost. Most farmers take a great deal of trouble in harvesting their hay, cutting it at the right time, putting it together quickly, and stacking it carefully, and there their trouble ends; and so it might, had they gone to the somewhat trifling expense of erecting a suitable covering for their stack. He alluded here to stacks preserved for home use that are built always on the same site in close proximity to the chaffcutter and stables. In building a covering for the protection from the weather the main point to be considered is the roof, which of course needs to be sufficiently large to cover the required amount, and it will pay to use good stout timber and galvanised iron, and if one side and end are covered in for about half-way down, or say six or eight feet, the west and north, these being the prevailing rainy quarters, it would be sufficient, as very little rain penetrates the walls of a stack. It is an advantage to build the roof sloping from the east, or the least exposed quarter. The hay is more easily pitched from the load under a sloping roof than it would be if the roof were a gable, though the latter would be more protection, but from observations he thought that all the rain that they got from the east would not be harmful. This point can best be decided by the person most concerned. The advantage of the sloping roof is to facilitate the stacking; it can be seen that it is not an easy matter to stack hay when near the roof, especially if it is a gable. The old method of thatching a stack with straw is more expensive than most people think, as, generally speaking, there is no straw available for thatching until after the wheat harvest, and how often does it happen that between the hay and wheat harvesting they get a thunderstorm, of which, coming before the stack has settled down, every drop of rain goes in, and a good portion of the year's hay supply is damaged. It is not the most pleasant feeling for a farmer when his stack is nearing completion, and a thunderstorm in view, with no means of covering it; whereas, if he is stacking under a roof, every load is so much more safely out of danger, and he can rest peacefully as far as his hay is concerned, instead of being in a continual state of fear and trembling whenever there is a cloudy sky. To protect the stack from mice procure a number of short posts, say three feet long and about six inches in diameter (round posts will do), to act as piles for floor of stack. Put them in the ground about eighteen inches, in rows, six or eight feet apart, or at convenient distance to carry the floor, which may consist of any scrap timber, gum, mallee, or sheaoak rails, or old fencing posts. On top of the piles place a half kerosine tin as a cap. This will effectually prevent mice from getting into the stack from the ground. A few may be thrown on when carting, but not many, if a little care is taken. It is also necessary to nail a little tin or zinc around the posts that carry the roof. If hay is not left lying about on the ground around the floor it will prove mouse proof. The benefit of such a shed is considerable. Bushels of corn will be saved in the hay; it will be more palatable to horses than if riddled by mice; and how often does it happen towards the end of the winter, when the stack has dwindled down to a ton or two, that a hurricane causes a collapse, and the remaining portion is damaged by the wet, and is suitable for bedding only; but if under a permanent roof could be kept for the following season, if not required for the present use, or sold, it being in thoroughly marketable condition, instead of so much manure. He was convinced that if this plan had been adopted during the last two seasons on many farms in this district there would be more fat horses in the stables, a few more pounds to the credit of farmers' banking accounts, to say nothing of the worry and annoyance saved. Such necessary comforts are worthy of more consideration than is given them by the majority of us. Mr. Dall built a shed last year on the lines suggested by Mr. Birks, and found it answer splendidly. He did not, however, make it mouse proof, but was convinced that the work entailed by so doing would be amply repaid.

Kanmantoo, May 27.

PRESENT—Messrs. Lehmann (chair), Mills, O'Neill, Thiele, R. H. and J, Downing (Hon. Sec.).

PACKING EGGS FOR MARKET.—A long discussion on this subject took place. Members were satisfied that eggs carefully packed in light, soft material, like chaff, would carry any distance without injury, provided the packages were handled with anything like reasonable care. Members complained, however, that city firms receiving consignments always deducted a large percentage for chipped eggs. This was considered an unfair tax on the producer, as if the eggs were chipped, as stated, it was in many cases caused by rough handling by the firms' employes.

FOXES.—Foxes are increasing in this neighbourhood, and are doing a lot of harm amongst sheep and poultry. Members agreed that the most successful way of dealing with the pest was by means of poisoned baits. Native birds were the best baits, and of these the Rosella parrot seemed most tempting. An unpoisoned bird was dragged along as a trail in the neighbourhood of the foxes' retreat, and poisoned birds buried at intervals just under the ground.

Rhine Villa, May 27.

PRESENT—Messrs. G. A. Payne (chair), F. F. and H. W. Payne, Farey, Start, Mickan, Hecker, Pannach, Lewis, W. F. and J. W. Vigar (Hon. Sec.).

STANDARD BUSHEL.—Mr. F. E. Hecker read a short paper on this subject, and a good discussion ensued. Members would favour a fixed standard of 62 lb. per bushel and also thought that wheatbuyers should use a larger measure when testing the weight of wheat, as the very small measures used render mistakes in the weight very likely.

SIZE OF WHEATSACK.—Discussion on this subject took place. Members would not oppose a small reduction in the size of the sack, provided that it would hold at least 200 lb. of flour.

Kingscote, May 9.

PRESENT—Messrs. Turner (chair), Bell, Nash, Carter, Wright, and Cook (Hon. Sec.).

MEMBERSHIP.—Members approved of alterations in membership rules suggested by Wilmington Branch, but would not permit candidates to nominate themselves.

GRASSES AND CLOVERS.—Mr. P. T. Bell read a short paper on his experience with introduced grasses and clovers on scrub land. He took up land on the island in 1869, and brought with him a quantity of seed of yellow trefoil and prairie grass, which was sown on a small fenced area. Both grew splendidly, and he gathered five bags of seed after cutting some for green feed. Next year he sowed nearly all the seed on newly burnt scrub land. It came up well, but most of it died off as the winter set in. On dry limestone land near the coast, however, he had better success, but the sheep soon ate the prairie grass out, while the trefoil had spread widely since then. Italian rye grass and rib grass both did well on enclosed areas, but neither lasts well if grazed by sheep, though the latter stood for nearly three years. Rib grass was, he thought, the best to sow on newly burnt land. Dutch clover, like the others, does well, but will not stand grazing. With it he got a small, rough-leaved clover, which does well on the rough, stony creeks, and gives a lot of food in winter. He had also tried various native grasses, but was of opinion that it was no use sowing grass seed on new ironstone country. The land should be fenced and stock kept off for two or three years, burning each year to destroy the scrub He found buffalo grass very useful on stony and sandy land near the coast. It was indestructible, and would grow to the edge of the salt water. Mr. Bell also tabled splendid sample of "Oldman" saltbush.

Woolundunga, May 7.

Present—Messrs. Prosser (chair), Michael, Greig, Smoker, Bentley, A. and W. Barritt, and Rogers (Hon. Sec.).

Work of Branch.—The Chairman referred to lack of interest shown in the work of the Branch by the members, and stated that this meeting had been called to consider whether the Branch should be closed. Members generally thought that it would be a mistake to close, and it was decided to continue work, and make an effort to secure regular meetings.

Poison Plant.—Mr. N. Rogers reported having seen four cows dead in a paddock near Adelaide, and on enquiry he found three had been killed by eating the half-dry stems of the belladonna lily, and one by young sorghum. It was decided to ask the Inspector of Stock to give an address on stock complaints.

Port Broughton, May 26.

Present—Messrs. Harford (chair), Tonkin, Dolling, Whittaker, sen. and jun., Button, Gardiner, Pattingale, and Dalby (Hon. Sec.).

Membership.—Members all favour adoption of alterations in membership rules suggested by Wilmington Branch.

Breeding Lambs for Export.—Mr. Tonkin read a paper on this subject. He considered the lamb trade the most profitable branch of the sheep industry for the farmer. He preferred breeding from the half-bred Merino ewe and Shropshire ram. The lamb was hardy, quick-growing, and heavy, being fit for market at four to five months old. Last year he had lambs of this cross weighing 40 lb. to 60 lb. when dressed. Many farmers were prejudiced against the crossbred ewe because it was sometimes a wanderer. In this case, mate the purebred Merino and Shropshire ram. The progeny will not be so heavy as the former cross, but will all the same be very profitable. The percentage of lambs was better from the purebred Merino. In 1901 he had 85 per cent. of lambs, which sold at 8s. 6d.; in 1902, 90 per cent., which realised 9s. 2d. each, last year, 100 per cent., and got 10s. 6d. to £1 each; while this year his increase was 140 per cent. This was due to having two lambings. Sheep being very dear he allowed the rams to stay with the ewes, and so got two drops of lambs. Owing to the summer rains he had plenty of green feed in the stubbles and on the fallow, so that the ewes did well, and the summer lambs will be ready for market in a few weeks. Of course, the values now ruling were extreme, but he thought there was no likelihood of fat lambs fetching less than 10s. each for many years to come. He considered that from 300 ewes and six Shropshire rams a farmer should realise £170 a year by careful management. In the summer months water must be provided in every paddock, and care must be taken not to overstock. The lambs must always be sold before the feed gets too dry. There was less work and less risk attached and the returns were quicker with sheep than with any other stock. Some discussion took place on the question of breeding from crossbred ewes only, some members being of opinion that it was a mistake. Mr. Dalby feared that the farmer would find when he came to dispose of his ewes in three or four years' time he would have to pay a much larger figure for his new breeding stock. He contended that he would make more profit by breeding Merino ewes and rearing them. They would have the wool for three or four years, and be able to sell all surplus stock at a fair price.

Davenport, May 19.

Present—Messrs. Trembath (chair), Hewitson, Hodshon, Roberts, Holdsworth, and Lecky (Hon. Sec.).

Business.—Owing to the member who had promised a paper failing to attend or send his paper, no special business was before the meeting. The Hon. Secretary was instructed to convey to the defaulting member the disappointment of the members at his neglect, and his lack of courtesy in failing to even forward a reasonable excuse. Some discussion on the value of couch grass, lupin, marram grass, and mesembryanthemum for binding sand took place.

Wepowie, May 28.

Present—Messrs. Gray (chair), T. and R. Gale, Crocker, Bishop, Hanna, Roberts, Fisher, and Halliday (Hon. Sec.), and one visitor.

Standard Bushel.—Members decided to support the Kapunda Branch in demanding that only the imperial bushel of 60 ℔. be recognised in the purchase of wheat.

Pleuro.—Mr. J. Bishop read a short paper on this disease of cattle.

Nantawarra, May 25.

Present—Messrs. Dixon (chair), Belling, Herbert, Greenshields, Dall, Rattew, and Nicholls (Hon. Sec.), and one visitor.

Membership.—Members approve of proposed alterations in membership rules.

Stock Complaints.—Mr. Rattew stated that he had cured a severe case of impaction by giving large doses of aconite. Mr. Herbert initiated a discussion on live stock.

Boothby, May 3.

Present—Messrs. Whyte (chair), Chaplin, Way, Bradley, Foulds, Leonard, and Turnbull (Hon. Sec.), and two visitors.

Pickling Wheat.—Mr. Foulds initiated a discussion on this subject. It was agreed that it was a mistake to use too much water in pickling, as excessive damping of the grain impaired its germinating powers. Mr. Whyte read article from April issue of *The Journal of Agriculture* on pickling with formalin. Members wished to know if wheat treated with formalin would prove injurious to fowls or animals if eaten by them. [Although the poison is very much diluted it is just possible that injury would result if stock of any sort ate much pickled grain. -Ed.] Members consider some varieties of wheat more liable to smut than others, Petatz Surprise was specially mentioned in this respect.

Galvanised Iron and Netting.—Mr. Foulds strongly advised intending purchasers of galvanised goods to exercise care in selecting their materials, as a lot of both iron and netting now sold was of inferior quality. Members wish to know through *The Journal of Agriculture* if there was any method by which purchasers could satisfy themselves of the quality of the materials. Much of the wire-netting now used rusts very quickly, a serious matter where vermin-proof fencing is such a necessity.

Mundoora, May 27.

Present—Messrs. Harris (chair), Mildren, Shearer, Dick, Mitchell, Blake Loveridge, and Gardiner (Hon. Sec.), and one visitor.

Horse Complaint.—The Chairman read Mr. Desmond's report on horse disease on Yorke's Peninsula, and the treatment recommended was pasted in the minute book for future reference. The Chairman said he found young green wheat very effective in removing worms from horses, and advised members to sow a small patch early and turn the horses in when the crop had made good growth.

Feeding Horses.—Mr. Mitchell was using a considerable quantity of molasses in the feed for his horses this season, and was satisfied that they showed the benefit in their work. Mr. Dick was using copra cake with chaff, etc., for his working stock. Members were unanimous that salt was necessary for all stock.

Treeplanting.—Mr. Mitchell had observed that some of the sugar gums around the schoolhouse were being attacked by a small grub. These appear to attack the tree at the top, working downwards towards the trunk. Mr Mildren advised removing and burning the parts attacked.

Mount Compass, May 14.

PRESENT—Messrs Cameron (chair), Slater, Jenkins, Klaus, Chenoweth, and Good (Hon. Sec.).

MEMBERSHIP —Members approved of suggested alterations in membership rules, and would retire each year those members who have attended the least number of meetings during the year

PAPER —Mr Klaus read a paper on suggestions to aid the prosperity of the district. Discussion postponed.

Narridy, May 28.

PRESENT—Messrs Darley (chair) Lang, Freebairn, Smart, Dixon, Kelly, Turner, and Dunsford (Hon Sec), and three visitors

POULTRY —Mr H Turner tabled a pair of beautiful White Wyandotte fowls, and explained their chief characteristics The birds were greatly admired by those present

GRADING WHEAT —The Hon Secretary read extract from *The Journal of Agriculture* dealing with Dr Cobb's experiments, and a good discussion ensued Members are of opinion that all wheat should be sold on its merits, and that no sample weighing 61 lb per bushel should be docked in price

Mount Bryan East, May 28.

PRESENT—Messrs Bryce (chair), Thomas, Pohlner, F and E S Wilks (Hon Sec), and one visitor

NOXIOUS WEEDS —Mr Bryce read a paper on this subject He considered any plant productive of injury or hurtful consequences was a ‘ noxious weed ” A plant that was of little or no value for food but which choked out good herbage was a noxious weed, and as such should be dealt with They could not expect to keep every kind of weed under but every landholder should wake up to the necessity for dealing promptly with such as the star thistle, which was increasing in this district, and with the stemless horse thistle, which covered acres of land, to the complete exclusion of other herbage, and which, as far as he had seen, was not touched by any kind of stock even in the driest conditions He did not, however, believe in compulsory action in connection with the destruction of weeds, as the damage they do should waken up landholders to their own interests

MEMBERSHIP —Suggested alterations in membership rules, submitted by Wilmington Branch, met with approval

Utera Plains, May 28.

PRESENT—Messrs Venning (chair), H and R J West, Hale, Hornhardt, Abrook Deer, Jacobs, A R S and A R Ramsey (Hon Sec), and two visitors.

MIXED FARMING —Mr J L Watson read a paper on mixed farming *versus* wheatgrowing. He maintained that wheatgrowing alone would not pay, and that the farmer should give some attention to sheep, pigs, and poultry, but no more should be kept than can be properly attended to A few cows should be kept and the calves reared, as they can be profitably disposed of. The farmer should also rear a foal or two each year If of the right stamp, there would be no difficulty in disposing of them at a profit if not needed for farm work

BAGS AS WHEAT.—Dissatisfaction was expressed at the present practice of buying wheat, bags in.

Waikerie, May 28.

PRESENT—Messrs. Rowe (chair), Tuck, Perry, Blizard, Allen, Pickering, Jaescke, Lewis, Rogers, Starr, Wood, Jones, and Green (Hon. Sec.), and two visitors.

MEMBERSHIP.—Suggestions from Wilmington Branch were considered, but members thought the present system preferable.

VINEPRUNING.—Mr. Rowe read from Professor Perkins's "Theory and Practice of Vinepruning" the main laws governing pruning operations.

Cradock, May 28.

PRESENT—Messrs. Ruddock (chair). Gillick. Solly, Graham, Clarke, Garnet, Marsh, Fitzgerald, Paterson, and Lindo (Hon. Sec.), and two visitors.

HORSE DISEASE.—Mr. Paterson drew attention to the report of the Government Veterinary Surgeon in the May issue of *The Journal of Agriculture* on horse complaint on Yorke's Peninsula. In this report Mr. Desmond said the Hawker and Port Pirie outbreaks were due to the same cause. Mr. Paterson was pleased that some announcement had at last been made of the cause of the trouble in Hawker district.

BAGS AS WHEAT.—Strong feeling was expressed as to the unfairness of the present system of buying wheat, bags in.

Gladstone, June 4.

PRESENT—Messrs. Goode (chair), Rundle, Inglis, Burton, and Wornum (Hon. Sec.).

IMPROVEMENT OF WHEATS.—It was decided to ask the Council of Agriculture to appoint a committee to consider resolution carried at Gladstone Conference in favour of a testimonial to Mr. R. Marshall for his work in connection with the improvement of wheat.

STANDARD BUSHEL.—It was resolved that the Hon. Secretary obtain signatures to petition to Parliament *re* this matter. Members expressed great dissatisfaction at the present one-sided method under which wheat was bought, but were anxious that nothing should be done to injure the reputation of South Australian wheat.

Orroroo, May 27.

PRESENT—Messrs. Moody (chair), Brown, Lillecrapp, Copley, Oppermann, Roberts, Robertson, and Tapscott (Hon. Sec.).

PICKLING SEED WHEAT.—Mr. T. H. P. Tapscott read a paper on "Is Bluestone a Preventive of Smut?" They often heard farmers say that they never pickled their seed wheat, yet they grew clean crops, while some careful farmers, who make it a practice to pickle, will usually admit that they have some smut in their wheat. The question naturally arises: Is bluestone a preventive of smut? His experience led him to say it was under reasonable conditions. Some varieties of wheat appeared more liable to smut than others; then climatic conditions have also to be considered. In the first place it was necessary to use only good bluestone, 6 or 8 oz. of which dissolved in 1¼ to 2 gallons of water was sufficient for pickling a bag of wheat. It was a mistake to use too weak a solution or too much water. He always pickled on a concrete floor, pouring the solution over the grain, and turning the grain three times, or twice on the floor and once into the bag. Last season he carried out a small experiment. He obtained some of Smart's Early wheat—which variety seems particularly susceptible to smut—mixed it with a few smut balls, and rubbed them together until the wheat was quite black. He then divided the grain into nine lots of 36 grains each, pickled, and sowed them, with the following results:—

No. 1. Pickled for five minutes in bluestone solution: nine plants grew; no smut.

No 2. Pickled for 10 minutes in bluestone solution; 13 plants; one only smutty.

No. 3. Pickled for 15 minutes in bluestone solution; 11 plants; no smut.

No. 4. Pickled for 20 minutes in bluestone solution; 19 grew; no smut.

No. 5. Pickled for 30 minutes in bluestone solution; 18 plants; only one smutty.

No. 6. Simply dipped in solution; 14 plants; four affected by smut.

No. 7. Not pickled; 18 plants, 17 of which were smutty.

No. 8. Pickled in salt water for 10 minutes; 15 plants; nine smutty.

No. 9. Pickled for 15 minutes in Condy's fluid; 17 plants; 14 smutty.

The germination was very poor, but he attributed this to the soil being very wet when seed was sown. Mr. Copley did not pickle seed sown in dry land, but considered pickling a necessary precaution after rain has fallen. Mr. Lillecrapp very seldom pickled, but he made it a practice to sow only very clean wheat. Most members favoured pickling.

Apples.—Mr. Moody tabled a large sample of Beauty of Australia apple grown in the district by Messrs. Northcott Brothers.

Elbow Hill, May 24.

Present—Messrs. H. Dunn (chair), Ward, Wake, Spence, Wills, Pike, Hay, and G. C. Dunn (Hon. Sec), and six visitors.

Weaning Foals.—Mr. S. G. Pike read a paper on, "Which is the Best Time to Wean Foals?" He thought farmers usually allowed the foals to live on the mother's milk too long. The general practice seems to be to wean at five months to six months, but, as the mares were usually in foal again by November, the milk was not of good quality, and the strain on the mare of suckling one foal and carrying another acted to the detriment of both. He believed that the foal, as a rule, could eat at about eight weeks, and, providing they were well looked after and given suitable food, they would thrive all right. The Chairman said he allowed his foals to run with their mothers until about seeding time, and found they throve satisfactorily. Mr. Wills thought farmers must study their own conditions. With good food the foals could run with the mother for six months, but an aged mare, inclined to fall away as the green feed went off, should be relieved of the foal earlier.

Three-bushel Sack.—Mr. H. S. Styles forwarded letter advocating the three-bushel wheatsack, but many of the members opposed it, urging that there would be little, if any, difference in the price of the bag; the shipping price would remain unaltered for some time at any rate, that alterations would be necessary in machinery, and that where now two men loaded up the sacks, one would attempt the work, to his injury.

Colton, June 4.

Present—Messrs. Kenny (chair), Hull, Whitehead, Lewis, McCracken, and Packer (Hon. Sec.), and one visitor.

Prize Wheat at Adelaide Show.—At request of Branch, the Secretary of the Royal Agricultural Society forwarded weights of exhibits of wheats from various Branches of the Bureau. Lipson Branch obtained all three prizes, the three samples weighing 65 lb. 14 oz., 65 lb. 4 oz., and 65 lb. 3 oz. per bushel. The other samples were:—Brinkworth, 65 lb. 6 oz.; Willunga, 65 lb. 4 oz.; Yorketown, 65 lb.; Colton, 64 lb. 1 oz.; and Riverton, 62 lb. 6 oz.

Standard Bushel.—Discussion on proposed petition to Parliament re the adoption of a 60-lb. standard for wheat took place. Members thought it would be better to have a fixed standard of 62 lb., and pay extra for wheat over standard; as the buyer docked for wheat under weight, he would not lose by paying proportionately for wheat over standard.

Inkerman, May 24.

PRESENT—Messrs. F. C. Smart (chair), F. Smart, Lomman, Kennedy, Williams, Fraser, Board, Sampson, Mugford, and Daniel (Hon. Sec.), and four visitors.

MEMBERSHIP.—Members do not consider that suggested alterations in membership rules would be beneficial to this Branch.

THREE-BUSHEL WHEATSACK.—Mr. Sampson called attention to the movement by wharf labourers in Sydney to secure Government assistance in bringing about a reduction in the wheatsack to a maximum capacity of three bushels. He opposed the proposal, as did most of the other members. The arguments used were that a three-bushel bag would necessarily be shorter, and therefore unwieldy to handle, besides too low to sew up comfortably, it would prove more expensive to the farmer, and, if adopted, would result in boys being expected to handle them. It was resolved that this Branch is in favour of a uniform four-bushel bag, and that the Minister of Agriculture be advised through the Council of Agriculture of the views of the members.

Balaklava, June 11.

PRESENT—Messrs. Robinson (chair), Anderson, Baker, Black, Manley, Neville, Reid, Smith, Thompson, Tiller, Thomas, Spillane, Tuck, and Burden (Hon. Sec.), and one visitor.

OFFICERS.—Messrs. A. W. Robinson and H. P. Burden were elected Chairman and Hon. Secretary respectively, a vote of thanks being accorded to the retiring officers.

STANDARD BUSHEL.—Considerable discussion on circular from Kapunda Branch took place, but discussion was postponed till next meeting

Gawler River, May 27.

PRESENT—Messrs. Parker (chair), Leak, Hillier, Baldwin, Kreig, F. and H. Roediger, A. M. and H. Dawkins, Spencer, and Bray (Hon. Sec.), and one visitor.

STANDARD BUSHEL.—Members did not approve of Kapunda proposal for a fixed standard of 60 lb., as they considered such a low standard would result in a reduction in the price of our wheat in London. It was unanimously resolved that this Branch favours a permanent standard of 63 lb. per bushel.

DAIRYING.—Mr. F. Roediger gave a short account of a visit paid to a dairy farm at Woodville, where 60 to 70 cows are milked regularly. Lucerne and hay form the main part of the food, about 30 acres or more of lucerne being irrigated. The Ayrshire-Jersey cross cows were formerly kept, but they proved rather quick-tempered, while the shortness of the teats was also a drawback. The introduction of a good Shorthorn bull had a marked effect on the herd, the progeny being large-framed, docile, easy to milk, and good doers. Mr. Dawkins mentioned that he found the Shorthorns bad "fencers," but one member attributed this to education. If the calves are kept in well-fenced enclosures they do not develop into fence-breakers, but tying them to fences will teach them the habit. The value of the milking strain of Shorthorn cattle was referred to, and it was resolved that the Branch urge the Council of Agriculture to advise the Government to import some bulls of milking strains of Shorthorns, in order to improve the dairy herds of the State. The deterioration of the dairy herds was attributed by some members to breeding from immature stock.

EFFECT OF MANURE ON SEEDS.—Some discussion took place on the effect of mineral super on small seeds it may come in contact with. Members thought the acid in the manure would probably affect the germination of small seeds, and would advise applying the manure some time before sowing the seeds.

Golden Grove, May 26.

PRESENT—Messrs. Milne (chair), McPharlin, Maughan, Angove, Haines, McEwin, Maddigan, Ross, Buder, and Robertson (Hon. Sec.), and one visitor.

STANDARD BUSHEL.—Members favoured Kapunda proposal for a fixed standard of 60 lb. per bushel.

PIG COMPLAINT.—The Hon. Secretary reported that three of his brood sows had farrowed prematurely, about two weeks before their time. The sows were quiet and in good condition. They had been receiving raw mangolds for some time, and were scouring a good deal. None of the members had had any similar experience with their pigs, but thought abortion had been brought on by scouring, which they attributed to the mangolds.

Petina, May 28.

PRESENT—Messrs. Penna (chair), Cocks, Johnson, and Wallschutzsky

SHEEP AND WOOL. -Mr. G. Cocks read a paper on this subject. Owing to the drawback and expense attendant on the shipping of sheep from the West Coast, it will not pay farmers to devote attention to the mutton or lamb trade. They should, therefore, breed a good class of Merino sheep, and work to improve the wool. Summer lambs were unprofitable in these parts, generally becoming stunted. Rams should be placed with the ewes in December, and removed not later than the end of February. The rams should receive careful attention, so that they are in good condition when placed with the ewes. The wool should be carefully classed and packed for market, all inferior fleeces being kept by themselves. Care should be taken of the skins of sheep that are killed for rations. He advised fixing a straight piece of timber about 10 ft. long in the shed, firmly secured To this, spikes about six inches in length, should be placed at intervals of three feet, and the skins hung on these, stretching them from shoulder to shoulder.

WIRE-NETTING FENCE.—Some discussion took place on the best way to erect a rabbit-proof fence. It was agreed that strong posts and three wires, in addition to the netting, were required. The posts should have a slight lean outwards to prevent the rabbits climbing the netting.

Stansbury, June 4.

PRESENT—Messrs. Sherriff (chair), Faulkner, Anderson, Humphries, Jones, and Pitt.

STANDARD BUSHEL.—Discussion took place on proposal of Kapunda Branch for a fixed standard of 60 lb. per bushel. Members oppose this idea, but would urge the Chamber of Commerce to fix the standard earlier in the season.

Port Elliot, June 18.

PRESENT—Messrs. Hutchinson (chair). Pannell, Gosden. Nosworthy, Henry and Hamilton Welch, W. E. and W. W. Hargreaves (Hon. Sec.).

MEMBERSHIP.—Members were unanimous in their approval of alterations in membership rules suggested by Wilmington Branch.

STANDARD SAMPLE.—Three of the members supported proposal of Kapunda Branch for a fixed standard of 60 lb. per bushel. Strong exception was taken to the action of buyers in docking the price for wheat weighing less than the standard, and at the same time refusing to pay extra for over-standard wheat.

POULTRY.—Considerable discussion on "Will poultry pay?" ensued. Several members took the negative, while others had made a profit out of their poultry. The Hon. Secretary called attention to figures given by Mr. H. Martin, of Minlaton Branch, showing a profit with wheat at 5s. per bushel.

Angaston, May 28.

Present—Messrs. Snell (chair), Player, Smith, Thorne, Salter, A. and W. Sibley, Radford, Vaughan, Friend, Trimmer, Evans, and Matthews (Hon. Sec.), and visitors.

Vegetable Diseases Bill.—A lengthy discussion took place on the provisions of this Bill, each clause being considered. The new Bill did not meet with the approval of members, and it was unanimously resolved that in the opinion of the Branch the provisions of the present Act should be rigidly enforced, and the Chief Inspector should have power to carry out the law without referring to the Minister of Agriculture for authority on each occasion.

Cherry Gardens, June 14.

Present—Messrs. C. Lewis (chair), J. Lewis, Jacobs, Potter, and Ricks (Hon. Sec.), and two visitors.

Membership.—Alterations in membership rules, proposed by Wilmington Branch, did not meet with approval.

Vegetable Diseases Bill. A lengthy discussion took place on the pro- members being opposed to its provisions.

Denial Bay, May 28.

Present—Messrs McKenzie (chair), Starling, Croker, Meier, Smith, and Gale (Hon. Sec.).

Mice Plague.—A lengthy discussion on this subject took place, all the members having lost more or less wheat and hay during the present season. Some had found stacking the wheat and horsefeed on piles fairly effective in saving them from the mice. Mr. McKenzie thought it would pay farmers to build mouse-proof barns, and described how these were built.

Saddleworth, June 17.

Present—Messrs. Frost (chair), Eckermann, Hannaford, Leeder, and Coleman (Hon. Sec.).

Membership.—Suggested alterations in membership rules were discussed, and approved by a majority of those present.

Wheat Standard and "Docking."—A petition from Kapunda Branch was read. The Hon. Secretary commented unfavourably on this petition, as being incorrect as to facts and unlikely to serve any useful purpose. The Corn Trade Section of the Chamber of Commerce attempts to get a fair sample of the season's wheat crop by mixing a large number of samples from all parts of the State of wheat judged to be up to the previous year's standard, still in operation; sealed packets of this mixture are generally distributed, and sent to Europe as a sample of the new season's crop. A bushel is carefully weighed, and the merchants announce that fair average quality wheat of the season weighs, say, 61¼ lb. to the bushel. This weight is not the standard weight of a bushel of wheat, as the petition asserts; but the weight announced by the Chamber certifies the quality of the season's crop, and upon that standard of quality cargoes are bought and sold; but all wheat is always bought on the Imperial bushel of 60 lb., and no Act of Parliament is required to enforce that, since it is universally recognised. He thought, however, that the use of samples judged to be up to previous standard was not a fair way to obtain a true standard of quality, nor was it fair to "dock" the value of 2 lb. of wheat for every 1 lb. under the standard. The opinion was expressed that it would hardly be possible to have any fixed standard of quality, though it might average nearly correct in a series of years.

Fallowing.—The Chairman read a short paper on this subject. He favoured a three-year course: Fallow, grain crop, and then grazing the third year till fallowed again. It was necessary to have good implements in order to do good work. A plough of three or four furrows was large enough. The local ploughs were well made and do good work, but might be higher in the beam and longer to allow greater clearance of soil and rubbish when sticky. If the land is free from stones or stumps a set plough was preferred. With stones a stumpjumper saved many breaks, and strains. It was easier for a man or a boy to steer a four or six or even ten furrow plough than a single one. He would commence ploughing as soon as possible after seeding, say, June 1, finishing about the middle of July to end of August, in this district. It was a good plan to fallow a bit before seeding if land was in good order. If the paddock is not hilly he favoured ploughing around, but care should be taken to avoid having the furrows running up and down the steeper parts, lest they should wash out. The depth varied with the land, but on his farm 5 in. was deep enough. Leave the ploughing open in winter, harrowing about the end of August with heavy harrows. Cultivate about 3 in. deep in September; and, if necessary or time permit, cultivate again about 2 in. deep, at end of October. With one cultivation only, the beginning of October was the best time, as the weeds had then got a start. He would sheepproof all paddocks, as rubbish could be checked and kept well down by sheep. The paper was favourably commented on. Mr. Eckermann and the Secretary could plough most of their land 6 in. If occasionally a little clay came to the surface it became distributed with the after workings with advantage rather than otherwise. The Chairman remarked that a disc plough would leave the broken-up subsoil at the bottom.

EDUCATING THE FARM BOYS.—An article from an American paper on this subject was read. The writer laid stress upon the imparting of dearly bought experience and knowledge of those who had spent a lifetime almost on the soil to their sons. Such knowledge of weather and crops was invaluable, and was not to be got from books or learnt in the schools; in short, make a companion of your boy, and teach him all you have learnt about farming from actual experience.

Mount Remarkable, May 26.

PRESENT—Messrs. Challenger (chair), Jorgensen, Kaerger, Foot, McIntosh, Yates, Morrell, Casley, and O'Connell (Hon. Sec.).

STANDARD BUSHEL.—Some of the members favoured Kapunda proposal for a fixed standard of 60 lb. per bushel, but others considered this too low, and likely to have a very bad effect on the reputation of South Australian wheats on the European market.

Lipson, June 14.

PRESENT—Messrs. Potter (chair), Swaffer, G. and C. Provis, Brougham, Carr, Bratten, France, Baillie, Brown, and Barraud (Hon. Sec.), and one visitor.

CATTLE COMPLAINT.—Mr. George Provis reported that a cow of his dribbled very profusely when chewing her cud, and would like to know the cause and treatment. [Not sufficient information given; possibly due to acute indigestion. Give plenty of soft food and tonics.—ED.] Mr. Charles Provis reported trouble in mare, which members thought to be due to being badly "sanded."

HARVEST RESULT.—The Hon. Secretary read notes on this subject. Fallowing had undoubtedly proved vey beneficial in this district, as his experience had demonstrated. In 1899, which was not too favourable a season, the rainfall being light and irregular, they reaped 15 bushels per acre, while on autumn ploughed land only 5 bushels to 6 bushels per acre; 70 lb. super per acre was applied to both areas. In 1900 they had an unusually wet year, consequently there was less difference in the yields, viz., 16 bushels from fallow and 14 bushels from ploughed land. In 1901, which was also wet, rust was bad, especially on the fallowed land. In 1902, a very dry year, the fallowed land yielded 14 bushels and the ploughed land 7 bushels. Last year was another wet season, and the yields were 18 bushels and 15 bushels respectively. The fallowing has undoubtedly a marked effect on the moisture-holding capacity of the land, as evidenced by the yields during dry years.

Whyte-Yarcowie, June 18.

PRESENT—Messrs. Hack (chair), Dowd, Pascoe, Makin, Lock, Mitchell, Hunt, Jenkins, Mudge, Pearce, Kornetzi, McLeod, Faul, and Boerke (Hon. Sec.), and five visitors.

METRIC SYSTEM.—The Hon. Secretary gave an interesting address on the principles and advantages of the metric system of weights and measures. Members were greatly impressed with the simplicity of the system, and hoped that it would soon be the recognised system throughout Australia. Mr. Makin dealt with what he considered the injurious effects the producer would suffer under the "white Australia policy." [Political subjects like this should not be discussed at Bureau meetings.—ED.]

EXHIBITION OF SOUTH AUSTRALIAN WHEATS.—Mr. Dowd thought it would be a good plan for the Government to arrange for the exhibition of a few samples of South Australian wheats in the principal grain centres of America, England, and Europe.

Forest Range, June 2.

PRESENT Messrs. Monks (chair), Vickers, Collins, Hackett, McLaren, and J. Green.

VEGETABLE DISEASES BILL. Considerable discussion on this subject took place, and it was resolved that, in the opinion of this Branch, the proposed Bill was too drastic. Members strongly favoured carrying out the provisions of the Fruit and Vegetable Protection Act, rigidly enforcing the restrictions against the sale of codlin infested fruit. Members thought, however, that no action should be taken by the Department when less than 7 per cent. of the fruit in any case was found affected.

BUSH CURRANTS —Mr. Hackett read a paper on this subject. Black currants require strong land, which should be deeply worked before planting, and, if possible, a good dressing of stable manure or coarse bonedust should be dug in. The aspect was not of vital importance, but the land should be well drained and be fairly moist in the summer. The bushes can be divided and replanted at any age, but two-year-old plants were preferable. After planting it was a mistake to dig deeply around the bushes. No more cultivation than required to keep them clean should be given. The best of the fruit is borne on the previous season's growth, and pruning will consist in cutting out the wood of more than two years' growth, and shortening back where necessary. Red currants will thrive in poorer and drier soil than black currants. In pruning the aim should be to get six to eight branches from as near the ground as possible. These should not be pruned until they reach the desired height. Afterwards they will put out laterals, which should be cut back every year to three or four buds. The red currant fruits on the old wood, and all new growth should be cut back except where required to form a new main branch. White currants require similar treatment. Ogden's Black, White Imperial, and Red Imperial were the best varieties he had grown in this district, but he thought that in the end they would get improved bearers from seedling currants.

Minlaton, June 18.

PRESENT—Messrs. Correll (chair), Vanstone, Twartz, Boundy, Anderson, J. and H. Martin, Brown, Newbold, A. and J. McKenzie (Hon. Sec.), and four visitors.

STANDARD BUSHEL.—Considerable discussion took place on circular from Kapunda Branch. Members were not prepared to support proposal for a fixed standard of 60 lb. per bushel, but it was resolved to suggest for consideration at Congress:—"The standard weight of a bushel of wheat: Is the farmer paid for wheat over standard, and who gets the benefit of the docking practised by buyers for wheat under standard?"

THE FARMER'S AIM IN LIFE.—Mr. B. W. Newbold read a paper on this subject, in which he urged the necessity for farmers aiming to get the highest results in all their operations, and the value of comfortable surroundings, to recompense in some way for the ups and downs of the farmer's life.

Clarendon, June 13.

PRESENT—Messrs. Payne (chair), Juers, Spencer, Pelling, Phelps, Morphett, Piggott, A. and A. A. Harper, and Wright (Hon. Sec.), and one visitor.

SHOEING HORSES.—Mr. A. A. Harper read a short paper on this subject. He thought there was room for improvement in the method of shoeing horses. As far as he could see, the blacksmith shod the horses just as they were shod thirty years ago. First a piece of the hoof, generally more than necessary, was removed with the toe knife, and the shoe made red hot, when it is applied to the hoof until it fits. He thought that there should be less burning, as it made the hoof brittle. The shoe should be made to fit by rasping and trimming the hoof. Then too many nails were generally used. If driven properly five were sufficient for a heavy shoe, and four for a light one. Instead of being driven straight the nails should be unevenly placed, as they will give a better hold. Considerable difference of opinion existed amongst members on this question.

Johnsburg, May 28.

PRESENT—Messrs. Chalmers (chair), Potter, Dunn, Luckraft, Caughlan, Hombsch, Masters, and Johnson (Hon. Sec.).

STANDARD BUSHEL.—Mr. F. W. Hombsch read a paper on this subject. He referred to the general feeling that under the present system the farmers were entirely in the hands of the merchants, and were often unfairly treated in reference to the docking of wheat He urged the farmers to unite to secure a better system. Either have two standards, as suggested by Mr. Gleeson, or one standard, and pay for over-standard samples at the same rate as under-standard wheat is docked. As an alternative, it might be possible to adopt the auction system, when the middleman would be dispensed with to a considerable extent, and the wheat would be bought according to sample. He did not favour the Kapunda proposal for a 60 lb. standard, as this was too low, and would injure their reputation on the London market. After a long discussion it was unanimously resolved that this Branch believes in the standard being fixed as high as the season's growth permits, and that the buyer in testing the weight of samples should use not less than 5 lb. of wheat; also that wheat under standard be subject to a reduction of one pound weight on every bushel for each pound under standard, and that wheat over the standard be allowed for at same rate.

NOXIOUS WEEDS.—Mr. Potter called attention to the spread of noxious weeds throughout the district, and thought more stringent measures should be taken to carry out the law. Members generally agreed with Mr. Potter.

Morgan, May 28.

PRESENT—Messrs. Windebank (chair), Hahn, Lindner, Hewitt, R. and H. Wohling (Hon. Sec.), and four visitors.

WATTLE-GROWING.—Mr. Windebank read a short paper on this subject. He had noticed wattles growing in gardens in various parts of the district; some were quite 30 ft. in height. It was true they were in selected spots, but he thought it would be worth trying them along the watercourses and swamps, as there were many such places in the district where, he believed, it would pay to grow wattles. The broad-leaf or golden wattle was the most suitable kind, and could be planted closer than the black wattle. He advised roasting the seed before sowing. Make a fire of leaves or small wood; then in the hot ashes place the seed and leave it for about fifteen minutes. He estimated that seed would cost 1s. per acre, rent for seven years 14s., ploughing 5s., scarifying, thinning, etc., for two years, £2; and netting fence, £10; or a total of £13 per acre, by the time the wattles were fit to strip.

EXHIBITS.—Mr. R. Wohling tabled sample of lucerne fully 18 in. high, from seed sown in September. Mr. Windebank tabled samples of various weeds growing on his farm, and attributed their prevalence to summer rains.

Port Germein, May 28.

Present—Messrs. Stone (chair), Deer, Blesing, Holman, Thomas, Smith, Kingcome, and Basford (Hon. Sec.), and two visitors.

Marram Grass.—Considerable discussion on binding drift sands took place, and it was unanimously agreed that marram grass was the most effective agent for this purpose.

Noxious Weeds.—Mr. Holman initiated a discussion on this subject, dealing mainly with the prevalence of Bathurst burr and star thistle, the latter of which was now covering large areas of land. This had been brought about by landowners neglecting to keep their lands clean, the result being that floods and winds had distributed the seeds over the country. He suggested that the Branch urge the District Council to enforce the provisions of the Noxious Weeds Act. Most members supported this proposal, and agreed to assist the Council in the direction indicated.

Millicent, June 2.

Present—Messrs. McRostie (chair), Varcoe, Oberlander, Mutton, Campbell, Hutchesson, Hart, Stuckey, Holzgrefe, and Davidson (Hon. Sec.).

Lime on Sour Land.—The Hon. Secretary gave a short account of various matters which had come under his notice during a recent trip to New Zealand. He was much struck with the results from the application of ground, unslacked lime on low-lying and swamp land. Its use had resulted in hundreds of acres of otherwise valueless land in Southland district coming into immediate cropping, and the Government were so impressed with the value of this practice that agricultural lime was carried on the railway free of charge. Up to three tons per acre was used, but most farmers had found it better to apply a smaller dressing and use it frequently.

Export of Lambs.—Mr. Hutchesson showed account sales for lambs exported through the Produce Depot. A number were damaged in transit, and he estimated the loss in weight at 4 lb. per head, besides which the rail charges were heavy, in fact, it cost as much by rail from Kalangadoo to Adelaide as by steamer from Adelaide to London. He netted 8s. 5d. per head, which, under the circumstances, he considered fair, though the local price at the time he exported the lambs was equivalent to 9s. per head. He was satisfied that with local freezing works South-Eastern farmers would realise 2s. 6d. to 3s. per head more for their lambs. The heavy rail charges on both stock and butter came in for considerable comment, and Mr. Campbell suggested that the friends of the farmers who removed the extra land tax last year had caused them greater expense in rail freights on their produce. He knew one man who would have paid £5 more in land tax had no alteration been made, whose account with the railway came to £30 for carriage of his wheat.

Co-operative Bacon Factory.—Mr. Campbell read a paper urging the establishment of a co-operative bacon factory on the same lines as the butter and cheese factories. No expensive plant would be required to start with, and better facilities could be provided as the business progressed. Members thought something should be done in this way by pigbreeders, as in this district they were in the hands of one firm, which could pay what it liked for pigs. Mr. Holzgrefe doubted whether a co-operative factory would be a success, and quoted the results of the rabbit-preserving factories in the South-East, which were now privately owned; but Mr. Campbell pointed out that these were never co-operative factories. Mr. Hart considered there was ample scope for a bacon factory, and if the matter were taken up he was prepared to erect a curing room and smokehouses.

Prices of Agricultural Implements.—A recent visitor from Canada forwarded price lists of various farm implements. Various makes of binders cost from £22 to £24 in the United States, and £30 to £32 in Canada; hoe drills, from £16 to £22; disc drills £28 to £30; double-furrow plough, £8, mowers, £11; 10-ft. rakes, £6.

Maitland, June 4.

PRESENT—Messrs. Smith (chair), Hill, Tossell, Hasting, Heinrich, Kelly, and Bowey (Hon. Sec.).

RUGGING COWS.—Several members decided to experiment in this direction this winter.

STANDARD BUSHEL.—This Branch decided to support movement of Kapunda Branch for securing a fixed legal standard for wheat.

ANNUAL REPORT.—Nine meetings held; average attendance, nine; papers read, two. Messrs. W. Bowey, J. Hill, and H. G. Tossell were elected Chairman, Vice-Chairman, and Hon. Secretary respectively. Mr. Hill read a paper on ensilage.

Willunga, June 4.

PRESENT—Messrs. Pengilly (chair), Richards, W. and J. Binney, Brown, Malpas, and Hughes (Hon. Sec.).

MEMBERSHIP.—Wilmington proposals for alterations in membership rules were discussed and unanimously opposed by those present. Members thought that reports of Bureau meetings did not indicate any strong demand for membership, nor was there any considerable attendance of visitors desiring to become members.

Naracoorte, June 11.

PRESENT—Messrs. Forster (chair), Attiwill, Cotton, Wardle, McLay, Williams, and Schinckel (Hon. Sec.).

ANNUAL REPORT.—The Hon. Secretary reviewed the work of the past year. Twelve meetings have been held, with an average attendance of 6.5 members. He thought this might with advantage be improved on. He also regretted that the meetings were not attended by more visitors. Five practical papers have been read during the year, various experiments carried out and reported on, and visits arranged by Professor Towar and Mr. G. S. Thomson. A vote of thanks was accorded to the retiring officers, who were re-elected.

MEMBERSHIP.—Resolutions from Wilmington Branch were discussed. Members see no necessity for changing the present system, but at the same time would not oppose the proposals if they meet with the approval of the majority of the Branches.

TIME IS MONEY.—Paper on this subject, by Mr. Barritt, of Onetree Hill Branch, was read and discussed. Members generally agreed with the writer of the paper, especially in respect to keeping tools in good order, and the value of paint as a preservative.

BROADCASTING MANURE.—In reply to question whether manure should be applied before or after ploughing, the Chairman advised where it was to be broadcasted to plough first and harrow the manure in. Members stated that where bonedust was applied to the land the sorrel grew very vigorously.

LUCERNE.—Discussion took place on best time to sow lucerne seed. Members generally had found autumn sowing the best on the porous black soils in this district as the plant has a chance to get established before the dry weather sets in.

Bute, May 24.

PRESENT—Messrs. Trengove (chair), A. and H. Schroeter, Stevens, Buchanan, McEvoy, Sharman, Cousins, Commons, and Masters (Hon. Sec.).

STANDARD BUSHEL.—Mr. McEvoy initiated a discussion on this subject. He supported the action of the Kapunda Branch in endeavouring to secure legislative action in the matter, as the present system was decidedly unfair to the farmer and was for the benefit of the merchant alone. He had ceased to hope for any voluntary reform, and was convinced that legislative action was the only means of securing fairplay. The merchants for years had always insisted that a high standard was of benefit to the farmer, as the wheat fetched a higher price in the London market, but the following extract from a letter received from a London firm of merchants, and published recently in Melbourne, gave this idea away. The writer said:—"When the Chamber of Commerce is fixing a standard sample of f.a.q. wheat, we recommend you to do your best to get them to settle the quality on a lower basis than in former years. It is no good fixing the quality higher, and then finding afterwards difficulty in getting wheat to come up to the standard. Such a course is all the more foolish in that it only opens the door for buyers to make claims, and they are not slow to take advantage of it. One or two arbitrations awarded in buyers' favour here will set demands for arbitration in motion on most of the wheat coming forward, and once the impression gets abroad that the shipments are not up to standard, it is pretty sure that arbitrators will allow something on nearly every occasion. Therefore, urge the people on your side not to be in too great a hurry to settle the matter early in the season; it makes no difference to the selling of the wheat whether the standard arrives here early or late. As a matter of fact, the bulk of the exportable wheat is sold long before any sample arrives. Records of shipments arriving early, however, are kept and compared with the standard when it arrives, and any disputes are settled then. Urge the people in Melbourne to take time and get the full representative show of the season's crop, and settle the quality always on the under side rather than on the over. This is the wish of every broker of position in the corn trade here. Australian wheat is sold as Australian wheat, and you get no more for it by fixing the standard high, and you get no less for it by fixing the standard reasonably; but in the latter case you will save a lot of arbitration, and you will certainly make the business easier for those who handle the wheat on this side." Most of the members supported Mr. McEvoy, the present one-sided method of fixing the standard entirely in the interests of the merchants being strongly condemned, and a motion favouring a fixed legal standard of 60 lb. per bushel was carried by eight votes to two. The Chairman, in opposing the motion, said he considered any such reform should be brought about by moral suasion; besides, no law could compel the merchant to buy the wheat unless it suited him. Mr. Sharman contended that 60 lb. per bushel would be a very inferior sample, and the adoption of such a low standard was bound to re-act on the farmer.

Amyton, May 26.

Present—Messrs. Thomas (chair), Mills, Gray, Hughes, Kelly, Wheadon, Gunn, and Mullett (Hon. Sec.), and three visitors.

Cattle-breeding.—Mr. George Wheadon read a paper on this subject. He was afraid there were good grounds for the statement that their cattle had, on the whole, deteriorated of late years, both in size and quality. In many instances the main cause was the losses occasioned by the drought. The demand for cattle for re-stocking resulting in high prices caused breeders to consider number rather than quality the main object. Every available cow, irrespective of her fitness, was used for breeding purposes, and the offspring naturally are not up to much. Then the use of undersized bulls of no specific breed could have no result other than inferior stock. There was no question that, while purebred stock cost no more to rear and keep, they were more remunerative than mongrel animals. Selection of breeding stock according to the purpose in view was essential to the building up of profitable herds. The most important factor was undoubtedly the bull. At the same time the cows used must not be neglected. While the small breeder could buy a good bull, it would probably cost him too much to buy purebred cows, and to effect an improvement he would advise selecting the best and most shapely cows in the herd and mate them with a high-class pedigree bull. The heifers from these cows should be kept for breeding, and the inferior stock disposed of. It may be urged that the cost and trouble of keeping a valuable bull would not be warranted by a farmer rearing only a few calves but this could easily be got over by three or four neighbours combining to purchase a good animal for their joint use. As a rule he did not advocate crossbred stock, being convinced that the purebred beast was the most profitable. The baneful effect of the use of small breeds of bulls on their cattle was very apparent, and he considered it would pay farmers better to adhere to the Shorthorn or Hereford types, according to the object in view. Members generally favoured the Shorthorn as the best all round cow for this district. The deterioration in the cattle was generally admitted as far as this district was concerned.

Mallala, June 23.

Present—Messrs. McCabe (chair), H. B. and A. Moody, S. and W. Temby, Marshman, East, Nevin, Jenkins, Warden, and Stephenson (Hon. Sec.), and one visitor.

Membership.—Wilmington proposals were considered, but did not meet with approval, members being of opinion that sufficient machinery was already provided to meet the needs of membership. It was decided to adopt an honorary membership in connection with the Branch.

Standard Bushel.—Proposals from Kapunda Branch were discussed. Although no resolution was arrived at, it was generally thought that Parliament should not be asked to legislate on this matter. Several members expressed the opinion that farmers should make the best sample of wheat possible, and then dispose of it by auction, a practice already adopted with success by several farmers in the district.

Paskeville, May 28.

Present—Messrs. J. C. Price (chair) S. R. Price, Goodall, Palm, Meier, and O'Grady (Hon. Sec.).

Agricultural College.—Regret was expressed at Professor Towar's resignation, and a resolution in reference to the recent enquiry into the management of the College was passed. [Criticism of the actions of the Government in respect to departmental matters cannot be published.—Ed.]

Size of Wheat Sacks.—Discussion took place on the movement of the Wharf Labourers' Unions for a reduction in the size of the wheat sack. Members were unanimous in condemning the proposal for a three-bushel bag as uncalled for, and calculated to increase the cost to the farmer of marketing his produce. It was also agreed that with the adoption of a small bag one man would attempt to do the work of two, and often boys would be expected to handle the smaller bags.

Caltowie, May 23.

Present—Messrs. Hewett (chair), Kerr, Graham, McDonald, A. and J. McCallum, Moore, Neate, Potter, Petatz, Royal, Jettner, J. and F. Lehmann (Hon. Sec.), and six visitors.

Horse Disease.—Mr. Desmond's report on horse disease on Yorke's Peninsula was discussed, and a note made of the treatment suggested.

Cattle Complaint. Mr. Petatz reported loss of three cows. He gave them Epsom salts by itself and also with treacle without effect. Another cow treated with gunpowder recovered.

Comparison of Old and New Land.—Paper read at Burra Branch, and published in the May issue of *The Journal of Agriculture*, was discussed. Mr. Kerr did not think there was much in the writer's contention as to necessity for renewing supplies of organic matter. On red land it might be advisable to let the stubble remain, but on dark, heavy soil he was convinced that no benefit would accrue. Mr. Graham thought that in a general way the paper was all right. If they could let the land lay out for a time and then plough under the green stuff it would improve the condition of the soil; but small holders could not do this.

Crystal Brook, May 21.

Present—Messrs. R. Pavy (chair), P. Pavy, Davidson, Hutchison, Venning, Morrish, and Symons (Hon. Sec.).

Membership.—Wilmington proposals were discussed at length, and it was resolved that, while appreciating the efforts of Wilmington Branch to infuse new life into the Bureau work, members do not consider their proposals practicable.

Selling Wheat by Auction.—Mr. W. J. Venning read a paper on this subject.

Richman's Creek, May 30.

Present—Messrs. Freebairn (chair), Roberts, Gebert, McSkimming, Knauerhase, Lehmann, and Kelly (Hon. Sec.), and one visitor.

Arbor Day.—It was decided to arrange for holding Arbor Day under the auspices of the Branch.

Disc Ploughs.—Discussion on the use of disc ploughs for breaking up new land that was a little stony took place. Members thought that the stumpjump plough was preferable for land of this character.

Questions.—The following information was elicited in reply to questions:—Cape and Algerian oats were the best varieties for the North. Members thought judges held the opinion that flatboned horses carried more muscle than roundboned animals, and were consequently better workers. They had found it dangerous to sow unpickled seed on land that carried a smutty crop of wheat the previous year. Where, however, summer rains occurred, there was little danger. Iron farm gates were considered best. Where these could not be afforded, a well-built wooden gate could be erected at small cost. All members thought it was best to mouth young horses before breaking them in. The contrivance for preventing bulls from breaking through fences, illustrated in *The Journal of Agriculture* a few months ago, found favour with members.

Water Conservation.—Mr. Gebert initiated a discussion on gardening and water conservation. He showed different kinds of vegetables grown by himself, which, he contended, showed that with proper treatment they could grow such things even in the dry North. His garden was about one square chain in area, and was divided into six beds, each surrounded by a bank of earth six inches in height. Above the garden there was an area of about two acres of patchy, bare ground, and from this the water was directed to the garden, the beds being flooded whenever possible. Care in selecting soil of a loose texture for the garden, with a good catchment area, was essential Since he had laid out his garden in the way indicated he had never lacked a good supply of vegetables. Two years ago the total rainfall during the winter months was only six inches, yet the returns from the garden were satisfactory. Last year at this season he had turnips weighing from 2 lb. to 3 lb each, while right up to harvest time they had a supply of onions and carrots, besides melons throughout the summer. Fruit trees in the garden had also thrived and yielded well.

Reeves Plains, May 29.

Present—Messrs. Folland (chair), McCord, Winton, Arnold, George, Corden, Richter, Alexander, R. and W. Oliver, W. and W. H. Day (Hon. Sec.), and three visitors.

Membership.—Wilmington proposals were discussed, and, with the exception of the suggestion that candidates might nominate themselves, were approved of.

Wheat Pest.—One member stated that in patches several feet in length the young wheat was being destroyed. Members thought mice responsible for the damage, but the member said the drill rows were so crooked he did not think it possible for mice to follow them and find the grain. He wondered whether the starlings, which were very numerous in the fields, would destroy the plants.

Rolling Wheat Crops.—Mr. Richter read a paper on this subject. It is well known that it is to the benefit of the farmer to have his fields of cereals intended for hay or grain rolled, so as to have a smooth level, and solid surface. By having an even and firm top on the field the wear and tear of machinery is not so great by one-tenth. Take the binder as an instance. Where the land is left in a rough state there is so much loose surface that the wheels of the machine sink in and create a dust, and some of this dust will find its way into the bearings, blocking up oil holes and causing much friction; but if the land is well rolled the machine or implement will keep on the top of the surface and cause a much lighter draught, which is a great consideration, as the team will do more work in the same time, and do it better. Besides, when cutting for hay the crop can be cut closer by from one to three inches on the rolled land, which in itself ought to pay the farmer for his trouble and expense. If the crop is for grain, the driving wheel of the stripper or harvester, as the case may be, will not skid or slip on a firm bottom, and will do the work more regular than on a loose surface. The roller most suitable for their country was a gum log about 8 ft. 6 in. or not more than 9 ft. long, as one longer does not run so straight, and turns at the corners very irregularly. The log should be 18 in. in diameter, with a short pole to project about 5 ft. in front of the frame, to pull by a chain from each corner, and to meet at the point of the pole where the team is fastened to. If it be necessary for one team to work more than one roller, the best plan is to work three rollers with one team of 5 or 6 horses, according to condition of soil; hook on as to a plough by hitching the team to the front roller; to fix the others so that each roller keeps in its appointed place, put a spreader inside at the back of the frame, bolted in the centre, on the middle and front roller, long enough to keep the outside rollers in position, a chain being hooked from each end of the spreader to the point where the team is hitched on. The best stage at which rolling should be done, in his opinion, was when the crop is high enough that none of the plants will get buried. If the crop has too much growth the roller will break or bruise the stem, and thereby stop the growth for a time. The land should be dry enough not to stick to the roller. If the land is too wet the roller will gather up the moist soil and become uneven. A roller should be perfectly round, and not like some he had seen, with a flat place or with a piece split off, which causes the roller to bump and make a ridge and furrow every few feet. Avoid rolling in frosty weather, if possible, and do not use the roller for breaking down fallowed land. The harrows should be used for this work.

Wilmington, June 22.

PRESENT Messrs. Robertson (chair), A. and M. Bischof, Zimmermann, Hannagan Lauterbach, Sullivan, Maslin, Slee, and Payne (Hon. Sec.), and several visitors.

BRANDS ACT.—It was resolved that this Branch heartily endorses the suggestions of Mr. Redman, of Kingston Branch, in reference to branding and way-billing of travelling stock. The question of earmarks on sheep was not so favourably viewed, members being of opinion that earmarks could be easily mutilated.

THE PRIVATE SEPARATOR.—Mr. W. Robertson read a paper on this subject:—This debatable question received marked attention at the late Strathalbyn Conference at the hands of Mr. Caldwell and Mr. Hargraves, each viewing it from a different standpoint: the former from its bearing on our export trade and the latter from its true and economic bearing on the interests of our producing community. Mr. Caldwell's statement that "South Australian dairymen require 4d per gallon for their milk, which Victoria can supply, of equal quality, at 2½d., requires confirmation, for factories now pay for milk on its percentage of butter fat. [We have the balance sheets for the Warrnambool Factory, Victoria, which show that the average prices paid for milk were as follows for the half-years ending respectively April, 1903, 4.47d. per gallon; October, 1903, 5.6d. per gallon; April, 1904, 3.73d. per gallon.—ED.]. The inference from the above is that the Victorian milk lacks quality, but equalises matters by an abnormal quantity, an inference that is untenable. Mr. Caldwell condemns the private separator, because it militates against the quantity of first-class butter for export, quite ignoring the fact of the great good it confers on the largest body of producers. By its use hundreds of farmers are able to send their cream hundreds of miles to leading centres by rail, as well as up to twelve miles by road, whereas without it there would be no contributions from these sources to supply State wants, whereby the quantity of choice separator available for export would be diminished. Without the private separator these isolated farmers would have to take unremunerative prices for their dairy butter or give up their dairies. It will not pay to send milk to a factory over five miles, and Mr. Caldwell would therefore condemn those outside that limit—and their number is legion compared with those within it—to abandon the occupation. No farmer from a business standpoint would work a private separator if the factory were within reach of his milk, because the value of the butter from his milk by factory separation is 2d. per lb. more than from his private separation. These are the relative prices ruling in Messrs. Tuckwell & Son's Wilmington factory, and where milk is paid for on its percentage of butter fat. These relative values are perfectly just, because the butter made from miscellaneous creams of various ages cannot possibly possess the high and uniform quality of factory butter which is churned from creams of one age and directly it is ripe. The dual cow is now admittedly the ideal farmer's milker, and the private separator assures the calf its daily meals of fresh, sweet milk, and instead of the heretofore starved "poddie" infancy, it matures into a growthy beast, and a credit and profit to the farm. The private separator has been the means of trebling our dairy herds; and although to-day many separators are comparatively idle, from the disastrous effects of the droughts, the farmers fully recognise them as an additional factor towards their prosperity. Mr. Robertson's views were generally supported. Mr. Lauterbach, manager of the local factory, while agreeing that it would be better if all the milk could be separated at the factory, thought such a practice was impossible in the northern areas, and, with proper treatment of the milk and cream by the dairyman, the separator cream could be converted into first-class butter. Mr. Lauterbach moved:—"That in the opinion of this Branch the Government should not lose sight of the necessity for thoroughly testing butter prior to export, and that the butter should be graded and branded accordingly with the Government stamp."

Renmark, June 23.

Present—Messrs. Turner (chair), Huggins, Geneste, Cole, Johns, and Evans (Hon. Sec.).

Pruning.—Waikerie Branch intimated a desire to visit Renmark when vine-pruning in operation, in order to observe methods adopted for the different classes of vines. It was decided to inform the Branch that members would be pleased to afford every information in their power should the proposed visit be made.

Marketing Dried Fruits.—Considerable discussion took place on this question in reference to the present position of the Dried Fruits Association. Matters were regarded as very unsatisfactory, and the hope expressed that better arrangements for maintaining reasonable prices could be adopted.

Amyton, June 23.

Present—Messrs. Mills (chair), J. W. and T. Gum, A. and J. Gray, Hughes, Kelly, Bristowe, Thomas, and Mullett (Hon. Sec.), and three visitors.

Annual Report.—The Hon. Secretary's report showed nine meetings held, with an average attendance of over nine members and three visitors. Seven original papers have been read, and various subjects of practical importance discussed. Messrs. W. Mills, W. Gum, and F. Mullett were elected Chairman, Vice-Chairman, and Hon. Secretary respectively.

Fertilisers.—Mr. W. Hughes read a paper on the use of fertilisers in this district. There was no doubt that the general practice of bare fallowing and taking the fields in rotation was the correct thing for these dry districts. Notwithstanding thorough cultivation on these lines they were faced by the fact that they do not now get such good yields as in the early days, when the land was new. The crop also seems to take longer to mature, and what promises to be a good crop often turns out light and the grain sometimes inferior. To his mind this pointed to some deficiency in the soil, and the natural question was what was the best manure to use. With his little experience and his observations elsewhere he had no hesitation in recommending mineral superphosphate. He had used this for two years. In 1900 he applied one ton to 50 acres with the drill on fallow, and drilled in another 50 on fallow without manure. This was a dry season, but he got 8 bushels from the manured land and 6 bushels from the portion drilled in without manure. In 1901 he applied the manure at the rate of 45 lb. per acre, but the season was very dry, and he got only 2 bushels and 1 bushel respectively from manured and unmanured land. With an ordinary good season he was certain the manure would tell very markedly. Its effect in hastening the maturity of the crop was [illegible] noticeable. When the manured wheat was well out in ear and the grain forming, the unmanured wheat alongside was only just coming into ear. The wheat and manure should be drilled in together, so that the plant got the full benefit of the manure from the start, as a good beginning often makes all the difference to the final result. Judgment must be exercised as to the condition of the land when drilling in the manure, as it was very risky to sow when the land was a little moist, as the moisture in the manure would assist in malting the seed. He preferred to sow when the ground was dry, as the manure goes in better than on wet land, and there was very little risk of the seed malting. Care must be taken to regulate the depth of sowing. The seed should be covered as shallow as possible. Many farmers when starting with the drill overlooked this point, and got the seed too deep. Results not being satisfactory, the practice of drilling was blamed, whereas all that was needed to prevent similar results was a simple adjustment of the drill. In the better districts the after benefit of the manure on the grass was very noticeable, and he thought they could expect similar benefit here. It would also be found an advantage to apply a thin coating of farmyard manure even in a dry district like this on low-lying land liable to be flooded. He strongly recommended farmers in this locality to try experiments with superphosphate on the different classes of soil. Considerable discussion ensued. Only a few farmers in this district have used super, and it was generally admitted that in such an uncertain district they could sow early wheats later and late wheats earlier when using manure than they could with safety without it.

Balaklava, June 22.

Present—Messrs. Robinson (chair), Manley, Baker, Black, Neville, Reid Smith, Hams, Pillane, and Burden (Hon. Sec.), and two visitors.

Balaklava Mill.—This meeting was held at Messrs. Verco Brothers' mill, at the invitation of the owners, members being shown through the mill by the manager (Mr. W. Harris), who carefully explained the treatment of the grain from the time it was purchased from the farmer until converted into flour, pollard, etc. Samples of the various products were also shown. Members were afterwards entertained at tea by Mr. and Mrs. Harris, and a hearty vote of thanks was accorded to host and hostess, and to Messrs. Verco Brothers.

Kingscote, June 13.

Present—Messrs. Turner (chair), P. T. and C. J. Bell, Olds, Wright, Ayliffe, Neave, and Cook (Hon. Sec.)

Earmarking Sheep.—A long discussion on this subject took place. Members are of opinion that provision should be made by the Government for the registration of earmarks.

Size of Wheatsacks.—Most of the members were opposed to the proposal to reduce the capacity of the wheatsack to three bushels.

Season.—Some discussion took place on the season, and it was agreed that the prospects were very promising.

Bute, June 14.

Present—Messrs. Sharman (chair), McCormack, A. and H. Shroeter, Hamdorf, and Masters (Hon. Sec.).

Smut in Wheat.—Mr. A. Schroeter read a paper on "Smut in Wheat: A New Theory." In his opinion smut was not a fungus, but was due to an insufficiency of gluten being dissolved in the germination of the grain. Smut was of infrequent occurrence when wheat was sown early in warm land, but was common when the seed was sown later and the ground was cold. This was due to the starch and gluten being dissolved when warm moisture came into contact with it, while under cold conditions the gluten failed to dissolve, resulting in the development of an infertile plant incapable of producing grain in the ears, its place being taken by what they called smut. The Hon. Secretary and Mr. McCormack showed the fallacy of this "new theory" and the reason why seed sown in dry ground would produce a plant free from smut, while similar seed sown after rain would produce an affected crop. [The proof that bunt or smut is a fungus is so absolute and the preventive treatment so well known, that this so-called "new theory" is not worth discussing.—Ed.]

DATES OF MEETINGS OF BRANCHES OF THE AGRICULTURAL BUREAU.

With a view of publishing in the "Journal" the dates of meetings of the Branches of the Agricultural Bureau, Hon. Secretaries are requested to forward dates of their next meetings in time for publication.

Branch	Date of Meeting		Branch	Date of Meeting	
Amyton	July 28	Aug 25	Morchard	July 23	Aug 27
Arthurton	28		Morgan	23	—
Balaklava	9	13	Mount Bryan East	23	27
Booleroo Centre	26	23	Mount Remarkable	21	25
Bowhill	2	6	Mundoora	29	26
Brinkworth	8	5	Nantawarra	27	24
Burra	15	19	Naracoorte	9	13
Bute	26	—	Narridy	16	
Carrieton	26	23	Norton's Summit	22	26
Cherry Gardens	12	9	Onetree Hill	21	25
Clare	22	26	Orroroo	29	26
Clarendon	11		Paskeville	23	20
Colton	9	6	Penola	9	13
Crystal Brook	23	20	Petina	23	
Dawson	23	20	Pine Forest	26	23
Elbow Hill	26	23	Port Broughton	21	25
Eudunda	25	22	Port Elliot	16	20
Finniss	4	1	Port Lincoln	15	19
Forest Range	21	25	Port Pirie	23	20
Forster	16	13	Pyap	6	3
Gawler River	22	26	Redhill	26	—
Gladstone	2	6	Reeves Plains	22	26
Golden Grove	28	25	Richman's Creek	23	22
Hartley	22	26	Riverton	23	20
Inkerman	26	—	Saddleworth	15	19
Johnsburg	23	20	Stansbury	2	6
Kanmantoo	22	26	Stockport	25	—
Kapunda	2	6	Strathalbyn	19	16
Kingscote	11	8	Utera Plains	23	20
Kingston	2	6	Virginia	25	22
Koolunga	21	25	Wandearah	25	22
Lyndoch	21	—	Watervale	25	22
Maitland	2	6	Wepowie	26	—
Mallala	—	1	Whyte-Yarcowie	16	20
Mannum	—	20	Willunga	2	6
Meadows	25	—	Wilmington	27	24
Minlaton	16	13			

INDUSTRY.

SUPPLIED BY THE DEPARTMENT OF INDUSTRY.

Labor Bureau.

Number of persons registered and found employment by Government Departments and Private Employers from May 27 to June 28, 1904

Trade or Calling	Number Registered		Number Employed
	Town	Country	
Laborers and youths	29	66	77
Carpenters	4	—	—
Masons and bricklayers	2	1	2
Plasterers	—	1	—
Painters	2	1	2
Plumbers and ironworkers	2	—	
Patternmakers	1	—	2
Fitters and turners	2	1	
Blacksmiths and strikers	1	1	—
Brassfinishers	2	—	—
Fireman	—	—	1
Cook	1	—	—
Waiter and porter	—	—	2
Apprentices	9	2	3
Cleaners	2	2	—
Porters and junior porters	10	4	—
Rivet boys	5		1
Totals	72	79	90

June 29, 1904.

A. RICHARDSON, Bureau Clerk

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